FARMERS DIGEST

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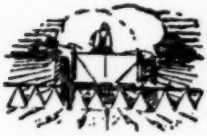
FARMER'S DIGEST, Fort Atkinson, Wis.

The **Farmer's Digest**

Volume 22 April 1959 Number 10

Here Come Your New Weed Killers



Information on the latest research with chemical weed killers is told in this timely article . . .

Condensed from Capper's Farmer

YOU may need a helping hand from the weatherman to get the most out of herbicides. That was the word from several weed scientists who told about their latest research at a recent Weed Control Conference.

In the northern third of the Corn Belt last spring, farmers got good and poor weed kills from chemicals put on at planting time. The problem: dry weather. One researcher after another said that working chemicals into the soil steps up their lethal punch. Puts the stuff in contact with moisture which helps move it into young weed seedlings.

A fairly new grass killer—Eptam—works better when mixed in as a preplant or before weeds poke thru. Twenty-seven weed men had this chemical in their tests last year. It handles both annual and perennial grass seedlings. Many crops, except small grains, can tolerate it.

Another versatile chemical called Neburon needs moisture to help it deal its killing blows. It was top among 24 herbicides tested on sorghum the last 2 years at the University of Missouri.

One weed scientist said 4 pounds of Neburon per acre kept milo weed-free. There was little effect of 2- and 4-pound rates on the crop. And there was no difference in milo yields between these two rates. Where cultivation was used along with Neburon, one cultivation was as good as two.

In other Missouri tests, Neburon and Eptam helped produce a whale of a lot of alfalfa the first

Reprinted by permission from Capper's Farmer, Topeka, Kansas

year it was seeded. Top yield—3 tons—was with Neburon at 2 to 4 pounds per acre. This was put on at early post-emergence. Alfalfa was up. Weeds were ½ inch tall.

Eptam at 15 pounds and Neburon at 2 pounds per acre gave good control of all weeds. All treated areas outyielded the check plots; made almost 1,000 pounds more hay.

Missouri researcher E. J. Peters summed up the tests: "Looks like we can seed legumes in the spring, control weeds with herbicides, and get desirable yields in the seedling year. At these low rates, costs shouldn't be too high."

Randox and Simazine, two recently marketed corn weed killers, came in for considerable discussion by weed scientists.

Backed by 3 years of testing at South Dakota State, Lyle Derscheid told the group that "you want fairly warm temperatures and enough moisture to get good weed control with Randox."

He believes you should have a rain within a week after applying Randox. You should have a rain within 3 weeks after Simazine application.

Both compounds are absorbed thru roots. Usually a good ½-inch rain will move them down to the root zone.

The granular herbicides we told you about a year ago may be just the ticket for the man who has an applicator for granules for corn-borer control.

These new weed killer pellets have gone thru full-scale tests at the Iowa station. Herbicides are impregnated on clay or tobacco granules. Idea is to apply them directly from the bag in a band or broadcast — much the same as you do granular DDT.

The best time to apply would be at weed emergence, said Iowa scientist W. G. Lovely, who reported on the work. He got slightly better control where he rotary-hoed and then put on granules; still better where he hoed them in. Chemicals tried were Eptam, Randox, and 2,4-D.

Lovely listed some obvious advantages for granules: There is no mixing of chemical; no water hauling or nozzle clogging.

There also are some drawbacks: You need a good dry place to store. Bulk weight is greater than spray concentrates so there's a certain amount of manhandling. Scientists don't know if or how fast the chemicals break down.

Weed scientists continually are on the hunt for new chemicals. Here's a preview of some new ones you may be using in the future:

For corn—Atrazine, a triazine compound closely related to Simazine, put out by Geigy Chemical Company, Ardsley, New

York. It controlled green foxtail and pigweed in corn when used at 1 to 4 pounds per acre pre-emergence. It may find some use as a post-emergence contact spray; could outclass Simazine.

For wild oats control—a carbamate (S-847) developed by Spencer Chemical Company, Kansas City, Missouri, has shown selective action against this pest of small grains. It is applied as a foliage spray at rates from 1 to 4 pounds per acre.

For use in soybeans and corn, two benzoic acids—Amoben and Dinoben—gave good control of broad-leaved and grassy weeds with no crop injury. Both are used before weeds emerge. Control with Amoben was rated excellent in beans; even rates as low as 1 pound per acre were good. Makers are Amchem Products, Inc., Ambler, Pennsylvania.

An acetamide material (CP-6936) applied pre-emergence at 4 to 6 pounds per acre looks good for control of all weeds in corn, beans, and certain truck crops. Higher rates are required on muck soils.

For Johnson grass control—Methoxy propazine killed 89 per cent of the rhizomes in initial tests. It was applied as a foliage spray at 20 pounds per acre.

Pigs Do Best Under Uniform Temperature

Pigs on test at the Illinois Agricultural Experiment Station performed best when air temperature was held constant.

In this experiment, pigs weaned at two weeks of age and fed for three weeks gained as well at a constant temperature of 40 degrees F. as at 60 degrees F., report scientists who conducted the test project.

Similar tests showed that when pigs were fed in drafty quarters and with temperature changes from 32 degrees to 60 degrees, they did poorly. In this environment even pigs furnished with supplementary heat in the form of pads, lamps, and hovers made very little gain.

These tests show that small pigs will adapt themselves to temperatures as low as 40 degrees F. and gain well as long as the temperature stays about the same, the scientists report. They recommend some form of supplementary heat. But draft-free housing is just as important. —*University of Illinois*

When Bloat Strikes Your Cattle

What to do to prevent and relieve bloat . . .

Condensed from
Wisconsin Agriculturist

Harold Severson

WHEN a cow or heifer that's been on alfalfa pasture starts ballooning up, what do you do to give relief?

Punch her with a trocar or a sharp jacknife?

Force some kerosene or turpentine down to make her gag, thus bringing up the gas?

Or insert a hose or rubber tube down her throat to accomplish the same purpose?

Whatever method you use, chances are you'll have another opportunity to use it again—unless you take steps to prevent bloating. It's much better to protect livestock from bloat than to worry about bloat "cures." It's a type of insurance program to prevent the loss of a valuable cow or heifer through the formation of excessive amounts of gas in the paunch.

When a cow's left flank starts swelling up while you and the family are visiting relatives in another part of the country, the animal usually dies from suffocation due to the great pressure on the lungs and heart. Your bloat "cures" aren't of much avail if you're 200 miles from home and unable to administer them.

That's why dairy farmers like J. Lawrence Nelson of Pierce county, Wisconsin, rely on an anti-bloat program.

"Don't turn hungry cows into a clover or alfalfa pasture," he recommends. "If a cow fills up too quickly, she's likely to bloat."

Nelson points out that alfalfa, ladino and other legumes are good livestock feeds. Yet fear of bloat keeps some dairymen from making full use of them. Rather than taking a chance on losing a good cow from bloat, they would

Reprinted by permission from Wisconsin Agriculturist, Racine, Wisconsin

prefer to keep them on a bluegrass pasture.

Feed Hay First

Nelson recommends giving the cows a good feed of hay prior to turning them out into the pasture. The hay seems to "tickle" the cow's paunch, forcing the gas to be released a little at a time. Cows that are not given this preliminary feeding rush into an alfalfa pasture. They graze rapidly, taking on a big load of slimy, gas-producing roughage that lies in their stomach.

Here are some suggestions of western Wisconsin farmers who seldom are bothered by bloating despite permitting their cows to graze on alfalfa.

"Start your cows in an alfalfa pasture gradually," recommends Virgil Thoner, Pierce county. "Take it easy—just leave them in for an hour or less the first day. Make it a little longer the next day, a few minutes more the succeeding day. This gradual change is usually better than a sudden shift. It gives the cows a chance to get used to the legumes."

Daily cutting has ended the bloat problem for William Jensen of St. Croix county.

"Just cut enough for the herd each day and feed it to the cattle in the barn or lot as fresh feed," he says. "The alfalfa should be cut low enough to include the stems with the leaves."

Daily cutting isn't always practical for some farmers so it's a good idea to toss some palatable hay in the same field.

I've seen my cows leave a succulent alfalfa stand and rush over to a pile of old hay and pick up several mouthfuls," observed one Vernon county farmer. "They must know instinctively the hay will bring up the gas."

Actually, alfalfa or alfalfa pastures should be pastured only after they're in full bloom. The cows should be kept off legume pastures during and just after moist weather, especially in early spring and the wet season of the fall. The danger of bloat is greatest when the plants are short and the weather favors rapid leaf growth.

Most seed treatment chemicals and fungicides are poisonous and should be handled with care.

Richard Bjerstedt, young St. Croix county dairy producer, says grass and legume mixtures will reduce the danger of bloat. Fields with at least 50 per cent grass usually are safe.

What do dairy farmers do when they spot a bloated cow? Here are some favorite remedies:

Put Stick in Mouth

"Get a stick and coat it with grease," recommends Richard Anderson, Pierce county. "Put it

in the cow's mouth and tie it on. The grease helps to bring up the gas."

Other farmers recommend vigorous massaging of the left flank and others advocate placing the animal with its front feet elevated. Administering a dose of 2 to 4 ounces of turpentine often gives relief. James Ray, St. Croix county, says he has rammed a milker hose down a cow's mouth to bring up the gas.

One dairyman in Vernon county, says he got fast relief when he forced a small quantity of sweet cream down the cow's mouth.

"Much better than turpentine or kerosene," he asserts. "The cow doesn't go off feed for several days and suffer a drop in production like she does when you give a kerosene or turpentine drench."

In the more severe cases, it may be necessary to get rid of the gas by means of a stomach tube. Or tap the paunch and release the gas by means of a trocar or a clean knife. A knife wound is slow to heal and may be a messy place for weeks later.

Number of U. S. Farmers Reaches All-Time Low

The number of U. S. farmers working to produce the nation's food supply has reached an all-time low.

Farmers engaged in agricultural production now make up only 12 per cent of the total U. S. population. These farmers are feeding themselves and the other 88 per cent of American citizens. By contrast, in the early days of our country 85 to 90 per cent of the people in America worked on farms.

To match the decrease in farm population, farms have grown from 174 acres for the average-size farm in 1940 to 242 acres per farm at the latest survey. Fifty per cent of these farms produced 90 per cent of the total farm output in 1957. The other 50 per cent, made up of smaller farm units, produced only 10 per cent.

Along with the increase in farm size, the cost of farm land has risen 40 per cent in the last 7 years. The trend to larger, more costly farms has forced more farmers than ever before to work off the farm. From 1950-1956, the number of farm owners working at off-farm jobs increased from 30 to 40 per cent. The number of farm wives working off the farm rose from 17 to 26 per cent during the same period. *—University of Wyoming*

How to Get a Good Stand of Trefoil

Now, it's easy to establish a stand of birdsfoot trefoil—if you manage this permanent pasture legume with knowledge of its growth habits . . .

Condensed from Successful Farming
T. L. Wainscott

BIRDSFOOT trefoil can be just about the best permanent legume pasture we have today. Cattle do not bloat on trefoil pasture. Once it is established, trefoil withstands continuous grazing better than other pasture legumes. Trefoil also produces large quantities of forage in late summer. Yet, in spite of these features, trefoil is not too popular with farmers.

The big obstacle to greater acceptance of trefoil has been the reports that trefoil is hard to establish. Farmers who have tried it have often failed to get a stand. The truth of the matter is, *folks tried to grow trefoil the same way they grew clover or alfalfa. They did not understand that trefoil is different.*

How to Grow It

Here are the facts you need to know to grow trefoil successfully:

First, trefoil seeds are small and hard—almost twice as many per pound as alfalfa seed, and up to 35-45% of them are "hard seed." *This means trefoil germination and emergence is slower than that of most all other legumes.*

Second, trefoil seed requires a special inoculant. The inoculant used to treat other legume seed —alfalfa, red clover, sweet clover, and others—*will not do the job on trefoil.* Treat trefoil seed according to directions on the can, just before planting.

Next, buy the best seed available. There is a great difference between the low-growing Empire type, and the upright imported types. Since trefoil is recommended only for pasture in many states, Empire type is first choice.

Seed prices on certified Empire are the lowest in history; about half of last year's price. Large seed crops are responsible.

Hold Down Companion Crops

Trefoil can't compete with fast-growing companion crops. The mixture used in seeding trefoil is very important. Most farmers have made the mistake of using other legumes and grasses in

Reprinted by permission from Successful Farming, Des Moines 3, Iowa

the mixture with trefoil. In practically every case, the trefoil fails. Plan to seed only 4 to 6 pounds of high-quality seed mixed with 2 pounds of timothy, or 3 pounds of orchardgrass, or 3 pounds of bromegrass. Use no grass at all if you are seeding a renovated bluegrass sod. The bluegrass will volunteer.

Oats offer an alternative nurse crop, providing they are clipped. Just 4 to 6 pecks of oats per acre, broadcast or drilled, will help control weeds, reduce erosion on sloping land, and provide some grazing. The oats must be grazed or clipped when it reaches 10 inches. Set the cutter bar at a 2½-inch height. Clip the oats 2 or 3 times if necessary.

Plant Seed ¼ Inch Deep

Many trefoil failures result from planting too deep. Prepare a good seedbed. Use a packer-seeder, or seed with a drill on the surface and follow with a cultipacker. Band-seeding over a strip of fertilizer placed 1½ inches below the seed is about the best way to get the stand off to a good start. Make your seeding early in the spring.

Trefoil cannot compete with weeds. It just develops too slowly. Therefore, new seedings should be clipped throughout the growing season to keep down the competition. Some of the hard seed continues to germinate throughout the first growing season. There will be plants of all sizes in the stand. The little plants must have a chance. Research shows that clipping does not seriously injure the trefoil stand.

Weed Killers

Chemical weed killers will do a good job of controlling weeds in trefoil seedings. Dr. J. M. Scholl, Iowa State College, finds a mixture of 3 pounds dalapon and ½ pound of 2,4-DB per acre, sprayed on in the spring (third week in May) is very effective.

This spray kills the grasses and sets back the broad-leaf weeds.

Use of these chemicals is not recommended at this time, al-

When the going gets rough, we should remember the adversities of one of our greatest Americans, Abraham Lincoln. In 1831 he failed in business. In 1832 he was defeated for the State Legislature. In 1833 he failed in business again. In 1838 he was defeated for speaker of the Legislature. In 1943 he was defeated for Congress. Elected to Congress in 1846, he was defeated for reelection. He was defeated for the Senate in 1855 and for vice-president in 1856. In 1858 he was again defeated for the Presidency. In 1860 he was elected President of the United States.

though they show great promise, as Food and Drug Administration is still checking on possible residues and related factors.

The Payoff

The time and effort spent learning how to get a good stand of trefoil pays off. Look at these beef production records, covering 3 full years, from the Iowa State College Experimental Farm at Albia, Iowa:

Pounds of Beef Per Acre

	Unimproved	Alfalfa-bromegrass	Trefoil-bromegrass
1951	77	243	235
1952	131	425	308
1953	94	260	259

By the third year, trefoil-bromegrass was producing as much beef per acre as alfalfa-bromegrass pasture, which contained little alfalfa by that time. In 1954, alfalfa had disappeared, while the trefoil continued to be satisfactory.

The ability to produce forage under continuous grazing and provide protection from bloat needs to be weighed against the early high yields of alfalfa. Trefoil has a place on land not well suited to alfalfa and in areas which will be in permanent pasture.

Low Hog Prices in 1960 if Increases Continue

Hog prices could be down to disastrous levels by the fall of 1960 if farmers carry through with their plans for increases in the 1959 and 1960 pig crops.

That's the opinion of Iowa State College Farm Economist, Francis Kutish. Kutish said farmers on Dec. 1—were planning to raise 13 per cent more spring pigs than a year ago.

The amount of this production increase is bound to mean lower hog prices and lower hog incomes in 1959, he added. But Kutish indicated the extent of the increase isn't great enough to prevent hogs from providing a more profitable market for corn than selling it for cash during 1959.

Kutish doesn't feel hogs are likely to sink to the 1955 disaster levels in 1959.

As a result, some further increase in the 1959 fall pig crop and in the 1960 spring pig crop can be expected. These increases, coupled with the 1959 spring increase, could pull hog prices down to "very low levels," he emphasized. Therefore, he predicted the disastrous level is more likely to come in 1960 than in 1959.

—Iowa Farm Bureau Spokesman

Don't Buy Weeds

A drill box survey finds some farmers planting as many as 8000 weed seeds with each pound of crop seed . . .

Condensed from Mississippi Farmer

WOULD you buy weed seeds and plant them on your best cropland?

Sounds ridiculous, doesn't it? But that's exactly what some farmers are doing when they buy uncertified seed—seed of questionable quality, unknown varieties and lack of purity.

An important contribution to new knowledge about seed was a drill box survey conducted last year by Mississippi State College agronomists.

This survey, reported in detail by Dr. James Delouche, assistant agronomist of the Seed Technology Laboratory at State College, showed that some farmers are buying and planting as many as 8,000 weed seeds in each pound of planting seed!

In many cases, farmers were found to be planting two or more varieties in a single field.

Preliminary results of the drill box survey show a lack of understanding about certified seed. The worst oat samples analyzed had a purity of only 76 per cent. The worst germination was 11 per cent! The bad oat sample meant the farmer was getting 75 cents worth of oats seed and a hatful of weed problems for every dollar spent on seed. The farmer with the poor germinating seed had to plant 10 seeds for every one that germinated!

By far the greatest need is an all-out educational program and plenty of cooperation from farmers. They must plant only top quality seed of known varieties and purity if they are to get the best results.

Often the price tag on certified seed is a trifle higher than seed without certification. But are these pennies worth reduced yields and higher weed costs?

Commenting at the recent meeting of Mississippi Seed Improvement Association, retiring president W. F. Lambert of Charleston said:

"With limited acreages and with keen competition for markets, it is necessary to produce maximum yields of top quality products. To do this it is essential that a farmer plant only the best seed available and be assured of a pure, adapted variety."

Reprinted by permission from Mississippi Farmer, Jackson, Michigan

Will You Feed Steers on Slat Floors?

An English farm experiments to reduce costs by saving litter . . .

Condensed from Farmer and Stock-Breeder

Douglas E. Fraser

SLATTED floors for beef cattle, veal calves and pigs, are being tried out on the Silcock farm at Milmoor in Cheshire, England. The aim is to cheapen production by saving the cost of straw as litter. In fact, it has been found that, in the case of cattle, the capital cost of the whole installation is equivalent to the cost of straw for some 12 or 15 months. As the installation is expected to last at least five years, possibly many more, the argument is clear.

In practice other definite, but unexpected advantages have already been noted. The cattle are much quieter than in ordinary straw yards and put on weight at a great rate. Calves too settle down much more quickly and are less excitable.

So far the arrangement is only experimental but is proving so attractive that Messrs. Silcocks feel it reasonable to let others know what they are doing.

The idea comes from Norway. One bay of a new covered yard has been used and, at the moment, houses 24 steers between nine and ten months old. As the ground slopes, the "pit" under the slats varies in depth from 3 ft. to 5 ft. 6".

The floor is of elm boards 12 ft. long, 3" thick and 8" wide at the top, chamfered to 7" at the bottom. They are set 2" apart at the top, in sets of three. The chamfering allows the manure to fall through easily.

The cattle are taken up to the floor on a concrete ramp which is afterwards covered by a section of floor.

The ends of the slats are supported on 9" brick walls at each end and in the center by a 6" x 8" timber beam supported at 10 ft. intervals by 14" x 14" concrete pillars.

Wooden yokes and trough are fitted along one side for feeding which is carried out from outside.

Easily Removed

The front of the "pit" is closed in by rough sawn elm boards kept in position by wedges. This is done for cleaning out, when the slats are slid on to the other half

Reprinted by permission from Farmer and Stock-Breeder, Stamford St., London S. E. 1, England

of the floor for cleaning out mechanically.

The area per steer is 20 sq. ft. and it is hoped that they may be finished as young beef without overcrowding.

A little sawdust — two sacks per week for the 24 — is sprinkled on the slats each day. This is not regarded as essential but as something to dry the manure.

During severe frost there has been a tendency for the manure to set between the slats. To counteract this, the effect of mixing a little salt with the sawdust is being tried.

Liveweight gain per day per beast has been 1.45 lb. on slats, compared with 1.3 lb. in the previous month when in yards.

Labor needed is down to an hour per day. This feeding and sprinkling of sawdust is done by a girl who has only recently left school.

The experiments with veal calves and pigs are also promising but it is too early yet to say more.

Bulk Tanks Lose Vitamin C

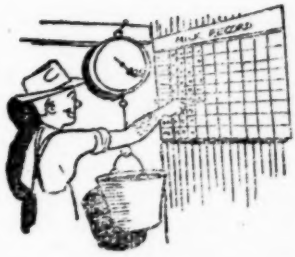
Picking up bulk milk every other day may have a lot of advantages, but recent University of Wisconsin research shows there will be less vitamin C in milk handled that way. Holding periods of 36 to 48 hours in a bulk tank will cause a loss of vitamin C.

Milk held that long in cans loses some of the vitamin, too—about 25 per cent in the dairy scientists' tests. But the bulk tanks increases the loss to 50 per cent to 70 per cent, the tests show. That's probably because the tanks keep agitating the milk and because new milk is added several times during the holding period.

One type of tank used in the tests had an agitator which caused a lot of splashing; this brought the milk into contact with the air more than in the other tank. Vitamin C losses were higher with this tank than with the other.

Loss of vitamin C has two bad effects, the researchers say. There's evidence that an undesirable oxidized flavor develops as vitamin C is lost. Also, this vitamin is lost in large amounts as milk is processed, so it's important to keep the initial level of the vitamin as high as possible. Low holding temperatures can reduce the vitamin loss, the research showed. Milk held at 48 degrees lost around 10 per cent more than milk held at the recommended 38 degrees. *—University of Wisconsin*

Who'll Cash In On Dairying?



The immediate future now looks brighter for the dairyman who will conduct an efficient operation . . .

Condensed from
New Jersey Farm and Garden

MAJOR changes have been taking place in dairy farming. Among these are:

(1) Fewer and fewer farmers are milking cows. The number of farmers keeping milk cows has been going down at the rate of about 4% per year.

(2) Herds are larger. Farmers are able to keep more cows on their farms because of higher crop yields, better management, greater mechanization, etc. For example, in the last 15 years, average size of DHIA herds has increased from 27 to 39 cows. Many farmers are increasing size of their farms to produce more feed to feed more cows. Michigan studies indicate that it is advantageous to add more land to grow more feed, especially as forage, rather than to buy feed to support more cows.

(3) Production per cow has steadily increased. It has gone up 23% in the past 10 years. To get this greater production, farmers have depended mostly on heavier grain feeding. Rate of grain feeding has increased about one-fourth in the last 10 years.

(4) Crop production and herd management have been mechanized considerably to reduce labor costs. Bulk tanks, pipeline milkers, barn cleaners and automatic feeding devices are appearing on more and more dairy farms.

Since 1958 milk production did not exceed that of 1957, it appears that production adjustments are effectively bringing supply in balance with use. The large reduction in milk cow numbers—down 32% from the 1946 high, made possible to a great extent by high prices for meat—has been an important factor in the leveling off in milk output. With the continued rapid increase in population, the demand picture should continually im-

Reprinted by permission from New Jersey Farm and Garden, Sea Isle City, New Jersey

prove. Thus, the immediate future prospect for dairying looks brighter for the man who chooses to stick with it and who will conduct an efficient operation.

Dairy farmers must intensify their efforts on the sale of their products to meet the terrific competition that exists. The dairy industry has been losing in per capita consumption of milk and its products. The per capita consumption on a milk equivalent basis in 1957 was 694 pounds, compared with 769 in 1947. The U. S. is 15th among all nations in per capita consumption. Thus, it would seem that one of the major problems of the dairy industry is to rebuild its markets.

Ignorance is far more expensive than education in the long run.

Adoption of new laborsaving equipment on the dairy farm does not automatically imply a more efficient operation. It usually must be paid for by expanded production, which, in turn, requires additional cash outlay. Careful analysis of the value of such developments to the particular farm should be made before adopting them. This is substantiated in some instances by research.

For example, New York workers report that power and machinery costs amount to 20% of the annual farm operating expenses of dairymen in that state. They were second only to feed purchases. The cost of hired labor amounted to only 8% of the total.

Michigan studies several years ago revealed that dairymen who went along with the trend towards loose housing, but failed to develop a really efficient arrangement for this method, actually increased their chore time and had reduced efficiency as compared to well-arranged and equipped stanchion barns.

Studies in California have shown that the real benefits of milking parlors are the inclusion of pipeline milkers. Their work showed that when pipeline milkers were installed in stanchion barns, labor needed to milk cows was nearly the same as that in a milking parlor.

Still other investigations at Beltsville, Md., and Minnesota have shown that sole reliance on green chop as a source of summer forage for cows does not increase feed yield per acre when the crop used is an ordinary pasture mixture, such as orchard grass-ladino clover. Other work has shown advantages in yields when tall growing crops were used.

However, the limitations of the benefits and the problems of acquisition shouldn't discourage the dairyman regarding ways to im-

prove his efficiency. In fact, a very small percentage of our dairymen take advantage of practices which were proven beneficial by research workers years ago. Some of these cost little more than consideration and thought on the part of the dairymen. A study recently published by a state ag experiment station revealed some startling facts along this line.

Data obtained from 471 farms indicated that out of 54 recommended practices, only 17 had been adopted by more than half of the farmers. In regard to feed production practices, only 52% applied lime according to soil tests; only 37% tested their soil for phosphorus and potassium every three to four years. Two per cent sowed cover crops into corn and other row crops. A mere 11% used a green manure crop on each field every three years.

Research several years ago established that early cutting of alfalfa results in better quality feed and will not seriously reduce the length of life of the stand. Yet, only 26% of farmers surveyed cut their alfalfa near one-tenth bloom.

Losses to U. S. farmers resulting from shattering of leaves and lowering of grade when hay is rained on are estimated at 27,193,000 tons. Studies at Beltsville, Md., have shown that this loss can be reduced by 14% if forage is preserved as wilted silage rather than field-cured hay. Yet, only 33% of farmers surveyed used any grass silage at all.

Purchasing Feed

Careful planning can often result in operation savings to dairymen. For more than two decades, short courses and adult classes have presented tables indicating how to buy protein supplements which were the cheapest per pound of protein. Six per cent of farmers surveyed used this information. It is also well known that purchasing feed supplements in quantity often brings discounts, as does purchase of fertilizer in

Each rat can cost a farmer $10 per year.

fall or spring. Twelve per cent purchased their feed in price-saving quantities. Thirty-eight per cent bought fertilizer at a saving.

On the more than 300 farms where dairying was a major enterprise, 33% had more than half of their cows freshening in the fall months, a profitable practice for that area. Thirty-four per cent fed grain to dry cows according to appearance to get them in shape for optimum production during the next lactation.

Milking Systems

For more than a decade, milking systems have been known and recommended with which a

dairyman could easily milk 20 to 30 cows per hour. The study showed that only 7% of operators on dairy farms milked over 20 cows per hour.

One of the reasons why the milk market is depressed is the availability of large supplies of nonfat dry skim milk. While consumer use of this important product is slowly increasing, this does not absorb the large amounts of skim milk that before World War II were utilized largely as animal feed on the farm. Since 1940, there has been a major shift away from farm separation of milk to selling whole milk in the manufactured milk area. Skim milk solids find their way on the market as nonfat dry milk.

This product, as well as dry buttermilk and dry whey, is a good animal food. Why shouldn't we use more as protein supplements? On a cost per 100 pounds of total digestible nutrients basis, and when the cost per 100 pounds is the same, dry skim milk is as cheap or cheaper source of TDN as any high protein supplement.

Then, too, in the manufacturing milk market, where milk is selling for $3 per 100 or below, and veal calves are selling for $25 per 100, it is probable that even whole milk could find a profitable market through veal calves. This would have the added effect of keeping some whole milk off the market. We have substituted calf raising feed mixtures with less and less milk in them, thus putting more fluid milk on the market.

Selling Dairy Beef

The sale of stock from the dairy farm averages about 10% of the gross dairy income. With prices of beef high, and expected to remain relatively high for some time, the opportunity exists for the dairy farmer to bolster his income by giving more attention to selling dairy beef. This can be done by better conditioning his cull cows before marketing and by raising some male calves as steers. Dairy stock steers make as rapid and efficient gains as do beef stock steers. Many farms have the feed supply and other resources to do this, and it would seem that the practice would be profitable in many instances.

Many people seem to think that charging something is not spending money.

2,000,000 Cows on Test

In 1906, dairymen established the cooperative program of testing cows for production. In its 52 years of operation, DHIA production testing has been extended to the point where this year 2,000,000 cows are on test. Number of cows on test has increased 30% in the past five years. Part of this recent expansion has been

the result of recent national emphasis on three plans of testing—the Weigh-A-Day-A-Month, the Owner Sampler and the Standard DHIA Plan.

The 52 years of record-keeping have shown the value of the work. In 1906, the 239 cows tested produced an average of 5,300 pounds of milk and 215 pounds of butterfat. In 1957, DHIA cows produced an average of 9,894 pounds milk and 389 pounds butterfat.

Recently collected DHIA data show that returns from milk over total costs of feed and care for cows producing 6,000 pounds yearly (about the national average) were only $9; cows producing 8,000 pounds, $41; cows producing 10,000 pounds (about the Standard DHIA Plan average), $51, and cows producing 12,000 pounds, $65.

Despite the indisputable benefits of the program, less than 11% of our cows are presently on test, including the breed association programs as well. The United States stands deep in the shadow of many other countries, in some of which more than 60% of cows are production-tested.

A similar situation exists in regard to artificial breeding. The program has shown phenomenal growth in the past 10 years. It offers the average dairyman the services of the best sires available and has been shown to be a cheaper service than keeping a bull for most farms. Yet only 27% of our cows are being bred by artificial breeding organizations.

Despite a wealth of research information and the intensive effort to take the research results to our farm people, we still have far too many of our dairymen ignoring the benefits of many recommended practices. Only those who are able to keep abreast with new developments, by selectively adopting those best suited to their individual situation without increasing costs beyond return advantages, and without getting too deeply in debt, will be in a favorable position to reap the benefits of a flourishing dairy industry.

An Automatic Hog Feeder that rations meal and water to pigs for a week was recently invented in England. It features a feed hopper floored with a canvas belt on rollers that moves forward to drop feed into the trough. A time switch operated solenoid releases water at the same time, twice or three times a day.

More Beef with Legume-Grass Mixtures

Well-managed irrigated pastures using legume-grass mixtures produced a thousand pounds of beef per acre . . .

Condensed from
What's New In Crops & Soils

R. W. Van Keuren, Irrigation Experiment Station, Prosser, Wash.

A thousand pounds of beef per acre were obtained recently in a pasture study in central Washington.

No new magic forages were used and fertilizer application was not excessive. Good pasture management was the key to this excellent production on irrigated pasture.

Forages used in the study were alfalfa with orchardgrass and with tall fescue, Ladino clover with each of the two grasses, and each of the grasses alone.

The first year of the experiment, the Ladino clover-orchardgrass mixture produced the highest gain—1,172 pounds per acre. All of the three other legume-grass mixtures also yielded over 1,000 pounds per acre. Despite heavy fertilization, the two grasses grown in pure stands consistently produced less than the mixtures of legume and grass.

Alfalfa-Orchardgrass Outstanding

For the 3 years of the study, the alfalfa-orchardgrass picture was the most outstanding, with an average of 937 pounds of beef per acre. Alfalfa made up over 50% of the forage mixture for each of the 3 years. This showed that alfalfa can be used successfully for grazing with good pasture management.

During the first year, there were approximately equal amounts of Ladino clover and grass in the Ladino clover-orchardgrass and Ladino clover-tall fescue pastures. However, the percentage of clover dropped way down the second year, and disappeared completely by the third year. With the disappearance of the clover, beef production also dropped. Orchardgrass was a better companion grass with either alfalfa or Ladino clover than was tall fescue.

The greatest decline in beef production occurred on the grass pastures. The third year of the trial the grasses grown alone produced less than half as much beef as the alfalfa-orchardgrass pasture. The grasses also required

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more fertilizer than did legume-grass mixtures to maintain production.

Ranger alfalfa, Pilgrim Ladino clover, S-143 orchardgrass, and Alta tall fescue were the varieties of forage used. The recommended seeding rates of legume-grass mixtures for this area are 5 pounds alfalfa and 8 pounds of orchardgrass per acre. With Ladino clover-orchardgrass mixtures, the seeding rates recommended are 1 pound of Ladino clover and 8 pounds of orchardgrass.

With either of the 2 legumes, 6 to 8 pounds of tall fescue will be adequate for a legume-tall fescue mixture. Perennial grasses are very seldom grown alone in this area for pasture. In this trial, each of the grasses was sown at the rate of 12 pounds per acre.

The pastures were irrigated, using the drill irrigation method with the corrugations (shallow ditches) spaced 36 inches. Each pasture was subdivided into four smaller pastures by singlewire electric fence for rotational grazing.

Split Application of Nitrogen

All of the pastures were fertilized with phosphate fertilizer at the rate of 50 pounds P_2O_5 per acre broadcast each fall. Nitrogen fertilizer was broadcast on all pastures in three equal applications on the last of March, early to mid-June, and late July to early August. Two hundred pounds of nitrogen were applied to the grasses during the first 2 grazing years; 225 pounds were applied in the third year. The legume-grass pastures were fertilized with nitrogen at acre rates of 125 pounds the first grazing year and 100 pounds per acre the last 2 years. Soil tests indicated the soil—a very fine sandy loam—was adequately supplied with potassium.

Previous work at the Prosser Irrigation Experiment Station has shown that seasonal applications of 100 pounds of available nitrogen, when applied at 3 intervals, produced as much forage as higher nitrogen rates. In addition, this level of nitrogen did not markedly reduce the percentage of clover in the Ladino clover-grass mixture compared with no nitrogen fertilizer. Split applications of nitrogen also gave better forage production later in the season when pasture growth normally declines.

Why dig up the whole pipe to locate a leak in an underground pipe? Pump water and thin white lime into the pipe. The lime will come to the surface of the soil.

Rotation of steers on the pastures was based on the stage of growth of the forage. The Ladino clover-grass mixtures and

the grasses alone were allowed to reach a height of 9 to 12 inches and were grazed back to about 2 to 3 inches. The alfalfa-grass mixtures were permitted to attain 12 to 14 inches or more and grazed back to about 2 to 4 inches. Frequently the alfalfa showed occasional blossoms at the time it was pastured. The pasture season in this area normally extends from late April or early May until early October.

The pasture was clipped as needed to remove any seed heads and rank growth that the steers refused to eat.

Two-pound Daily Gain

The Hereford steers used for grazing were yearlings, averaging about 670 pounds at the time they were put on the pastures in the spring. Before going on pasture, they were wintered so as to gain about 1 pound a day.

While on pasture, the steers on the legume grass pastures had about a 2-pound average daily gain for the 3 years. The highest average gain was obtained on the Ladino clover-orchardgrass pasture the first year with a season-long average of 2.44 pounds. The average daily gain for the grasses grown alone was about 1.75 pounds.

The steers had access to water and salt. The cattle on grass-legume pastures also had access to wheatstraw during the second and third year of the trials. No shade was provided.

The steers attained the U. S. Standard grade by the end of the grazing season. The cattle on the grass-legume pastures generally were much higher in grade than those on the grasses, and had a higher value — from $1.00 to $1.50 per hundred pounds—at the end of the grazing season than those grazing the pure grass pastures.

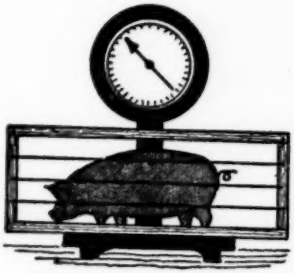
Bloat Losses

The average death loss for the 3 years because of bloat was 1.7 per cent. Bloat losses occurred on the legume-grass pastures, but grazing these pastures was much more profitable despite the bloat losses than grazing the grasses alone.

The ability of the grasses to produce profitable yields of beef under irrigated conditions and with heavy nitrogen applications had disappeared by the third grazing season. These results are also evidence that the high yield of legume-grass pastures under irrigated conditions can be attributed to the inclusion of a highly productive legume.

Well-managed irrigated pastures using legume-grass mixtures proved to be an economical source of feed for yearling steers. The net returns per acre compare very favorably with many other crops that are grown in this area of Washington.

How to Select Stock for a Swine Herd



Hogs usually are a good bet, specialists say, if you buy carefully and manage wisely . . .

Condensed from Pennsylvania Farmer

Grant W. Sherritt,
Pennsylvania State University

ONE of the first steps that will be considered by one embarking on a swine enterprise is the selection of the initial breeding herd, the plans for selection within the herd established, and the management of the breeding herd.

Swine Selection

The following factors are of importance in economic swine production:

1. A large number of pigs weaned per litter.
2. Heavy pigs at weaning.
3. Pigs that have a rapid rate of gain from weaning to market.
4. Pigs that use a minimum amount of feed per pound of gain.
5. Market hogs without excessive fat and with a high proportion of the preferred meat cuts.

The purebred swine associations have recognized the importance of these factors and set up the following minimum standards for these factors in their production registry and certification standards. They are as follows:

1. Eight pigs weaned per litter.
2. A litter weight as follows at weaning:

weaned at	35 days	56 days
Gilt	128 lbs.	275 lbs.
Sow	144 lbs.	320 lbs.

3. Hogs that weigh 200 pounds at six months of age.
4. A market hog that at 200 pounds, is 29 inches long, has an average back fat thickness of 1.2 to 1.7 inches, and has an average loin eye area of more than 3.75 square inches.
5. The breed associations have not set a minimum for feed utilization but testing stations have set as a maximum 320 pounds of feed per 100 pounds of gain.

These are minimum requirements and while many litters of hogs surpass one or more of them, any litter that meets all of them will have produced hogs at a low

Reprinted by permission from Pennsylvania Farmer, Harrisburg, Pennsylvania

cost that will bring top market price.

The designation P.R., for production registry, means a litter has met the above minimum requirements for weaning. A P.R. sow or boar has produced a specified number of litters meeting these requirements.

C.L. refers to a certified litter which has met P.R. requirements and from which two pigs have met the minimum growth and carcass requirements. C.M. indicates a litter produced by a mating that has previously produced a certified litter. A certified boar, C.M.S., has sired five certified litters.

Testing stations are found in many states. These stations accept pigs from P.R. litters and obtain growth, carcass and feed utilization on them. Many include boars in their testing and sell the boars meeting specified requirements.

Purebred Breeding Herd

A purebred breeding herd is one which depends on the sale of breeding stock as the major source of income. A commercial herd, on the other hand, depends on the sale of feeder or slaughter hogs on the market as its major source of income.

The breed selected is largely a matter of personal preference. However, if one expects to sell many breeding animals attention should be given to those breeds that are popular in the area and the state of the breeder.

In purchasing foundation or new breeding animals, those with certification or testing station records on themselves, their litters or parents should be purchased. This will guarantee starting with bred-in-production. Show ring records on the animal or its parents will guarantee correct breed type. In addition these hogs should be sound in their feet and legs, free from defects such as hernia and in the case of sows and gilts have sound udders with at least 12 sound, well spaced teats.

"If you aren't as close to God as you once were," said my wise mother, counseling a nephew, "you can be very certain as to which one of you has moved." —Burton Hillis

The purebred breeding herd today must carry on production testing through certification and, if possible, a testing station if it is going to compete in selling breeding stock. The herd must also be exhibited at livestock shows to maintain breed type and to advertise its product.

Commercial Breeding Herd

The commercial producer must keep the same factors of economic swine production in mind as those tested for by certification and testing stations. A selection

program based on these factors will assure low cost production of hogs that will sell on the market at highest prices. While he is not as concerned with breed type as the purebred breeder, he wants sound feet, legs, and udders.

The commercial producer can use crossbreeding as means of increasing his efficiency of production. Experiments by Pennsylvania State University and other colleges show that crossbred pigs grow faster and use less feed than purebred pigs. Crossbred gilts will wean more and heavier pigs per litter than purebred gilts. To take advantage of these benefits, a rotational crossbreeding program is recommended for producing hogs for market. A rotational crossbreeding program is based on the use of boars of three breeds. A boar of the first breed chosen is used the first year, a boar of the second breed the next year, a boar of the third breed the following year, and the fourth year starting over again with the first breed and rotating from one breed to another. Gilts are selected from within the herd on the basis of records of performance. In general, the less related the breeds the greater the effects of crossbreeding. Breeds should be chosen that are represented by herds of purebreds in the locality of the producer that has production-tested stock. The commercial breeder should be as interested in certified litters and certified boars as the purebred breeder when buying the breeding boars.

Testing Station Needed

A testing station provides the only reliable feed efficiency comparisons for buyers of breeding stock. In addition, it gives the producer, purebred or commercial, an opportunity to compare his hogs with those of other producers under the same conditions and a more unbiased estimate of the breeding value of his stock. In the case of the purebred breeder, it is one of the best possible advertisements. It provides the buyer of breeding animals an opportunity to select boars with known performance in all factors of economic significance.

The days of belligerent cows kicking over milk pails may be about over. A dramatic new tranquilizer, Trilafon, is now being used effectively to calm down first-calf heifers who are being milked for the first time.

All of the testing stations, except that of Illinois, that have been established were started with the financial assistance of the state legislature, the state agricultural college, or the agricultural industries of the state. All of these stations pay their costs of operation through money collect-

ed from the breeders using the facilities. The stations are operated by the breeders with the advice and help of agricultural college personnel. Swine producers need a testing station if they are to progress in improving their swine and compete with breeders of other states in the sale of breeding animals.

Breeding Management

It is recommended that gilts be bred at not less than eight months of age. On the average, the older a gilt is the larger the litter she will produce. Therefore, gilts selected from earlier farrowed litters have an advantage over later farrowed gilts to be bred at the same time.

The practice of hand mating; taking the boar to each sow or gilt when she is bred, makes it possible to know exactly when she will farrow. It also makes it possible to detect non-breeders or slow breeders. Hand mating makes it possible to have each sow bred twice during the heat period. It is the only possible way to control the timing of the service during the heat period.

If a sow is to be serviced only once during the heat period, she should be bred 24 hours after the first signs of heat appear. Servicing the sow a second time during the heat period, 12 hours after the first service, will result in 15 to 20 per cent more sows being bred at the first heat period and on the average one more pig produced per litter.

The boar needs plenty of exercise and he should not be used excessively. The following recommendations are generally accepted.

Maximum Use	Per Day	Per Week	Per Month
Boar over 15 months old	3	12	40
Boar less than 15 months old	2	8	25

Boars should be allowed to serve two or three females that are not to be kept for farrowing before the breeding season starts. This will assure that he is a working boar previous to the beginning of the breeding season.

A breeding herd in which rigid selection for the factors of economic swine production is carried on, and good breeding management practiced will produce profitable pigs.

The young couple had just finished going over their monthly bills and were down to the last two. "Gosh honey," said the man, "we're practically broke. I don't know which to pay—the electric company or the doctor."

"Oh, the electric company, of course," answered his wife. "After all, the doctor can't shut off your blood.—*Capper's Weekly.*

How Much Can You Crowd Layers?

Less floor space per bird is one solution to the producer's problem of high capital investment per hen. Read the results of a study concerning this problem . . .

Condensed from Poultry Tribune

A. W. Nordskog

TWO years ago, a project at Iowa State College was started to determine the relationship of floor space to egg production and laying house mortality. The goal was to find out whether certain strains of chickens might withstand the stress of crowding better than others.

To date, three experiments have been completed. Two of these were carried out at the Ankeny Research Farm, one starting in 1956 and the other in 1957. All comparisons were made between pens within the same house. In the third experiment started in February, 1958, four different houses with two pens in each house were used.

In the 1956 Ankeny experiment ten 9 x 12 ft. pens were used, with 36, 48, 60, 72 and so forth by additions of 12 up to 144 birds per pen. Two of these were Leghorns and one was Rhode Island Reds. Equal numbers of each strain were placed in each pen. Birds were debeaked at housing. The first pen with 36 birds allowed 6 sq. ft. of floor space per bird. With 48 birds per pen, floor space allowance was 4.5 sq. ft. The pen containing 144 birds permitted only 1.5 sq. ft. of floor space per bird. Water space, roosts, and nests were equalized to provide each hen with the same amount in each pen. An all-mash ration was fed using an automatic feeder. The amount of feeder space was 48 linear feet for each pen. The house was equipped with electric fans for ventilation.

Here Are the Results

It was found that egg production decreased by .6 of one per cent and mortality increased by .7 of one per cent for each 12 birds added. Within the range of floor space allotted in this ex-

Reprinted by permission from Poultry Tribune, Mount Morris, Illinois

periment, production decreased by .63 per cent and mortality increased by .85 per cent for each one sq. ft. of decrease.

Also noted was quite a bit of variation of mortality from pen to pen which was not accounted for by the crowding factor. We found that all three strains used were about equal in their ability to withstand the stress of crowding.

In 1957 the experiment was repeated in the Ankeny house using nine pens. Floor space allowance per bird ranged from 6 sq. ft. down to 1¼ sq. ft. The results again varied quite widely from pen to pen but on the average, egg production dropped 1.3 per cent and mortality increased .7 of one per cent for each one sq. ft. of decrease in floor space per bird. This is in good agreement with the 1956 experiment.

A third experiment using only Leghorns was started at the Ames farm in February, 1958 and continued to June, 1958. Four different houses with two pens each were used. Birds received a grain-mash diet. All 12 x 22 ft. pens were adjusted for feeder space and water space according to the level of crowding. The number of birds per pen ranged from 50 to 150 per pen. The results showed that egg production decreased by 2.44 per cent for each square foot of decrease in floor space per bird within the limits of space allotment in the experiment. In this experiment, we were not able to demonstrate any relationship of floor space to mortality.

Production Is Lower

Combining the results of the three tests, it was found that on the average, egg production decreased by only one per cent and mortality increased by .7 of one per cent when floor space is decreased by one sq. ft. per bird within the limits of crowding used in this study.

Just what do these results mean in more practical terms? Over the three experiments involving the total of some 2,760 birds, egg production averaged 61 per cent and mortality 15 per cent. Let's apply these figures to a ten month's period of production, or say 300 days, for pens containing 250 sq. ft. of floor space. Assuming an average egg price of 37 cents a dozen, we come up with the following results for birds housed at 1.5, 2.5, and 3.5 sq. ft. of floor space per bird.

Lower initial cost, reduced storage costs and less labor are the main benefits from using bunker silos to self-feed cattle, according to USDA.

Floor Space per bird	Egg Production	Laying House Mortality	Egg Income per bird	Egg Income Per sq. ft. of floor space	Total Egg Income from the pen
1.5 sq. ft.	60%	15.7%	$1.66	$1.10	$275.40
2.5 sq. ft.	61%	15.0%	1.69	0.68	169.28
3.5 sq. ft.	62%	14.3%	1.73	0.49	122.76

Birds housed at the rate of 1½ sq. ft. show an income of $1.66 per bird. At the rate of 2½ sq. ft. per bird the income per bird is $1.69 and for 3½ sq. ft per bird the calculated income per bird is $1.73. If we consider income on a per bird basis we would conclude that 3½ sq. ft. is the best. However, as the amount of floor space in reduced, the egg income per square foot of floor and total income per pen is increased. (See table.)

We conclude from our studies that although the amount of floor space does influence production and laying house mortality, this is not a major factor. In three experiments, the added mortality in the crowded pen could be accounted for almost entirely on the basis of piling and smothering when litter was added to the pens. Feather pulling, cannibalism, and egg eating was no more of a problem in the crowded pens than in the others.

A poultryman would be more concerned with income per unit of floor space and more particularly with maximizing income from his poultry house enterprise than he would in obtaining maximum income per hen. Accordingly, flock comfort would not be the first principle of sound poultry housing and management. Rather we would need to know how much stress from crowding the birds can tolerate to obtain maximum profit. This is one solution to the poultrymen's problem of high capital investment per hen.

What about the wet litter problem when floor space is down to 1¼ sq. ft. per bird? We kept track of the amount of ground corn cob litter used in the various pens in our 1957 experiment. During the test period from October 1, 1957, to July 15, 1958, 18½ bushels of litter for each 100 sq. ft. of floor space was used when the birds were housed at 1¼ sq. ft. per bird.

We also kept a record of the

NEW FOOD FASHION

Rancher Johnson, out our way,
Now takes food four times a day.
Says that calling dinner "lunch"
Adds a new meal to the bunch!
—By S. Omar Barker in Western Livestock Journal.

time used in adding or replacing the litter. In the above case, it took 31 minutes.

With three sq. ft. of floor space per bird, we added only 11 bushels per 10 sq. ft. of floor area between October and July which took only 19 minutes. Applying this to a house 30 x 100 ft., we find that crowding birds at the rate of 1¼ sq. ft. compared with the rate of three sq. ft. per bird would take about 225 bushels more of corn cob litter and would require an additional six hours of labor. This would increase litter and labor costs $30 to $35 per year.

We don't feel we have fully answered the question of what is the proper amount of floor space per layer. Conditions vary from one farm to another and from one area to another. We do feel, however, that actual experimental data showing how crowding influences production is long overdue and that the experiments we have completed are a contribution in that regard. We currently have underway a fourth experiment on crowding. This experiment will serve as a check on the reliability of the answer we have given to the question of the optimum number of birds per pen.

Adoption of Minimum Soil Tillage Spreads in Midwest

In University of Wisconsin tests, a corn plot yielded 123 bushels per acre when minimum tillage practices were followed. Conventional tillage methods turned up only 116 bushels. This difference in yields is probably not significant, but the cost saving is. And more important, say agronomists who back minimum tillage, the soil remains loose, discouraging weeds and promoting excellent moisture retention.

In 1956 and 1957, 40 Minnesota farmers took part in minimum tillage field trials and cut their farming costs by as much as $5 per acre. Growing numbers of farmers are asking themselves, each time they take out their tractors, "Is it really necessary to cultivate this field, or might I be better off to skip it?" Often the answer is, "Skip it." If widely adopted, minimum tillage practices could have significant overtones for producers of agricultural chemicals and equipment. —*Agricultural and Food Chemistry*

102 Ewes On 160 Dryland Acres

Here's a look at how a successful dryland feed and pasture program worked out in Wyoming . . .

Condensed from Wyoming Stockman Farmer

O. K. Barnes, Extension Conservationist

A dryland feed and pasture program started at the Sheridan, Wyoming, Agricultural Experiment Substation in 1955 supported three to four times the number of ewes usually carried on ordinary native range.

About 160 acres of dryland supported around 120 ewes for 12 months, with a little soybean meal supplement in late winter. The same acreage of unimproved native range ordinarily will carry only about 30-40 head a year.

How did we do it? It's nothing secret or mysterious—it's just management involving perennial and annual pasture, stubble, grazing, silage, grain, and hay—all grown on the 160 acres—and some purchased soybean meal and mineral.

Here's a year-around look at how the 160 acres of dryland were managed, starting in May.

May through June — Ewes on perennial grass pastures seeded mainly to crested, pubescent, and intermediate wheatgrass. Under Sheridan conditions, 50 acres of any of these pastures easily carried 120 ewes with lamb for 2 months. These pastures hold good until they become coarse and stemmy in July.

July through August — Ewes on annual pastures. A late May seeding of oats alone or oats and annual legumes furnished July grazing. Pasture in August came from Piper sudangrass seeded between June 1-10. These annual pastures have proved outstanding for grazing capacity. A 3-year average of grazing rates show 8-6 ewes per acre in July on an oat and annual legume mixture and 11.3 ewes per acre in August on Piper sudangrass.

With the oats we have tried different annual legumes, including soybeans and vetch. The legumes seem to add 20 to 30 per cent to the feed volume but we are not sure yet which legume is best. Late seeded oats alone make good pasture.

Used Same Ground

In seeding the oats and the oat-legume mixtures, we used the

Reprinted by permission from Wyoming Stockman Farmer, 110 E. 17th St., Cheyenne, Wyoming

same ground year after year, ripping it in the fall and then disking in the spring just before seeding. Seeding rate was about 1 bushel of oats plus 21-15 pounds of the annual legume.

In planting Piper sudangrass for pasture, we used fallow land to insure a reserve of soil moisture to keep the pasture green in August. Compared to the oat pasture, the sudangrass took twice the acreage because of the need for fallow. We drilled in the sudangrass at 15-18 pounds of seed per acre anytime in the forepart of June.

September through April—Sheep grazed stubble and hay fields into December with enough sorghum silage, barley, and oats (all grown on the 160 acres) to supplement the pasture.

In early fall the supplement started with 1½-2 pounds of silage and 1/3 pound of mixed oats and barley per head daily. By December, we had worked up to 4-5 pounds of silage and 4/10-pound of grain.

Added 2-4 Pounds

Beginning in December we added 2-4 pounds of grass hay. From about January to April, each ewe received 1/10-pound of soybean meal mixed with the grain. Total meal and grain fed per head ranged from 5/10 to 6/10-pound.

Sheep were shorn in the forepart of January each year; lambing started Feb. 1. These lambs went on the early July market at 75 to 80 pounds.

How We Handled the Land? We fenced the rougher parts of the substation land to confine the sheep. It included tillable land planted regularly to grain and silage crops as well as hay and pasture land.

Land used varied some from year to year but generally we divided the 160 acres this way:

Silage including fallow land—12 per cent; hayland—24 per cent; grain including fallow land—10 per cent; perennial and annual pastures including fallow land—54 per cent.

Under this operation, 1.3 acres of dryland has supported one ewe and lamb for 12 months except for soybean meal and mineral salt. At the same time, the operation actually allowed a considerable build-up of feed reserve.

The teacher had been telling the class about the larger animals. "Now, Henry," she said, "tell me where the elephant is found."

Henry hesitated for a moment, and then his face lit up. "The elephant," he intoned, "is such a very large animal it hardly ever gets lost."

Is Your Corn Plagued By Leaf Aphids?

If aphid colonies on leaves and tassels "dirtied" your corn last year, read this report from Ohio . . .

Condensed from
Ohio Farm and Home Research

C. A. Triplehorn

THE corn leaf aphid has become important in some areas during the past two years. Infestations of this insect, present in small to moderate numbers every year in cornbelt fields, erupted violently in northwestern and northcentral Ohio in 1957 and were blamed for heavy losses of corn.

Use Resistant Varieties

Right now the best control measure is the planting of resistant hybrids. Fortunately, most of the hybrids which have been developed to withstand the ravages of the European corn borer, are resistant to the leaf aphid. This has been noted time after time in widely scattered areas of Ohio. In Sandusky and Huron County cornfields where two or more hybrids were planted on the same date, the differences in numbers of infested and uninfested plants in two different hybrids amounted to more than 50 per cent in some instances.

Ohio County Survey

Most of the information obtained about this insect was obtained from Huron County, one center of heavy infestations during the past two years. On July 5, 1957 a heavy rain fell on this section. No more fell until August 20. In this intervening drought period the aphid populations soared and heavy damage occurred. Unfortunately, it was impossible to distinguish aphid damage from dry-weather damage. Neither factor could have been solely responsible for the severe injury.

In 1958 growers remembered this outbreak of the previous year and were watching their corn more closely. This made it possible to locate major infestations

Reprinted from Ohio Farm and Home Research, published by Ohio Agricultural Experiment Station, Wooster, Ohio

early enough for worthwhile observations to be made.

Abundant Rainfall

The 1958 growing season was characterized by abundant rainfall during late June and all of July. The July total alone was almost three times the normal amount for that month. By following the population fluctuation closely through the period of tassel emergence and extension, it was found that there were just as many aphids in 1958 as in 1957. The driving rains had not noticeably reduced their numbers.

Corn plants harboring major aphid colonies were tagged and followed closely through the season to determine the effect on yield. During the drought conditions of the preceding year, colonies the size of these were frequently associated with barren stalks. Yet with plenty of water available, the 1958 plants produced ears comparable to those with no aphids. Barren stalks for all practical purposes were nonexistent.

Definite Correlation

There appears to be a definite correlation between aphid infestation and availability of water to the corn plant in relation to yield. Many more observations will be required, however, before we can categorically state that in wet years growers may ignore the aphid.

In the first place, all but one field in which 1958 records were taken showed some reduction in yield on aphid-infested plants as compared to those which were aphid-free. This reduction ranged from less than one to almost ten per cent. Thus, the aphid still must be reckoned with as one of the factors preventing maximum yield, even in years when actual damage is below the economic level.

Secondly, there is little information available on the control of the corn leaf aphid with insecticides. Malathion and parathion, applied mostly by aircraft, were used in considerable quantities on

The United States has 49,800,000 television sets. The rest of the world has about 22 million.

Ohio fields. Both gave excellent kills when applied after tassel emergence had exposed the aphids. However, it is felt that few of the growers who resorted to an insecticide for aphid control in 1958 profited from this treatment. In unsprayed fields in the same area, the aphids disappeared almost as rapidly as in those receiving insecticides.

Limited Test

Eleven of the more promising materials were applied in a limited test at Wooster in 1958 and all killed the aphids which were actually hit. The problem is to

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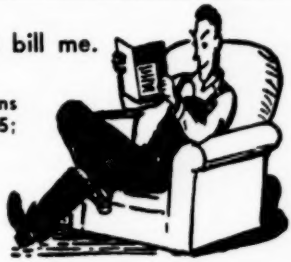

Here's a sketch of our farm where we publish Farmer's Digest. Our 200-acres are planted to corn, alfalfa, grass and trees. We farm — and we publish our magazine on a farm — because we believe that's the only way we can know what other farmers want to read. Farmer's Digest is probably the only farm magazine in the world published on the farm by farmers.

kill the aphids while they are still in the whorl of the corn plant; that is, before tassels emerge. Some of the systemic insecticides promise to do just that, but further research is needed before recommendations can be made.

Manipulating planting dates to avoid aphid infestation is not as effective as in the case of the European corn borer, although there is some evidence in favor of early planting. Aphid colonies, even the extremely large ones, die out naturally as soon as the infested portion of the plant loses its succulence. The corn leaf aphid, like most of its relatives, multiplies rapidly and can attain populations of damaging proportions in a matter of days. Males of this species are virtually unknown; for practical purposes, all aphids on Ohio corn, whether winged or wingless, are females. These efficient aphid-producing machines give birth to living young without male fertilization. The young aphids immediately begin sucking sap, mature in a short time and are soon able to reproduce themselves. In this manner they quickly form large colonies.

Long Season

If there is an "aphid season," it must be a relatively long one since aphids will attack corn, sorghum and barley right up to frost if the plants are at the proper stage of succulent growth to support them. The reason for their apparent short season and sudden disappearance on field corn is that most corn in any particular area is planted within a short period of time and goes through various growth stages at about the same time so that all the corn in the area becomes uniformly unfavorable for aphid development and the colonies die out.

Topdressing Alfalfa Will Improve Yields

If you fail to topdress alfalfa, you run the risk of low yields.

Agronomists say lack of topdressing usually means low alfalfa yields. Since alfalfa is a heavy user of nutrients, particularly of potash, a good stand depletes the available supply of potash in a year. Unless the supply is replenished, the yield will go down.

A good topdressing and management program keeps yields high, promotes vigorous growth, and gives longer-lived stands. Use from 600 to 1,000 pounds per acre of a 0-10-20 borated, 0-14-14 borated, or the equivalent in other analysis fertilizer.

Apply during the dormant season, or after the first cutting before growth begins again. Severe burning will result if the fertilizer is applied after new growth starts. —*V.P.I.*

Chimney Smoke

by Irene Rudie

May the blessing of rain be on you, the soft sweet rain.
May it fall upon your spirit so that all the little flowers
may spring up and shed their sweetness on the air.
— Old Gaelic Blessing

★ ★ ★

If the use of clothes dryers in the country becomes universal, where will the little birds find threads for nesting material, which they now find clinging to the clotheslines?

★ ★ ★

The family dog suffers more at housecleaning time than the often-pitied husband. The husband knows that order will eventually come from the chaos, but the little dog's world is disrupted and he fears the worst.

★ ★ ★

Teenagers resent necessary discipline, but have patience, parents, and in a few years those rebellious kids will be your best friends.

★ ★ ★

Just give us one day of soft spring warmth, robins on the greening lawn, and we forgive Minnesota for a long cold winter, just as young parents, after one night of uninterrupted sleep, forgive a fussy baby for all the wakeful nights.

Farmers know that burning destroys valuable humus, but warm spring days make fingers itch for a match, and the horizon is dotted with smoke clouds billowing up from burning meadows, and the night sky is red from burning grass.

★ ★ ★

The neighbor's team must have enjoyed a real horse laugh when it was hitched up to pull his new tractor out of the mud.

★ ★ ★

Among the joys of spring are the discovery that the expensive red maple lived through its second winter, the ferns we brought from the woods are uncurling their green fronds, and the iris the old sow chewed off is sending up a fresh spear of promise.

★ ★ ★

Two satisfactions of life, both achieved with the help of the Creator, are to raise a tall, straight tree from a little whip, and to raise a fine upstanding man from a little slip.

Feeding Grain to Dairy Cows

Follow these simple rules for proper grain feeding . . .

Condensed from
American Agriculturist

POOR cows get too much grain and the good cows too little, says Professor E. E. Anderson of New Mexico. "Higher average production can be obtained from the herd," he says, "by changing the common policy of 1 pound of grain to a definite number of pounds of milk."

By changing from the old rule of thumb method he had followed (1 pound of grain to 5 pounds of milk) to a system of feeding according to each cow's needs, B. J. Romig, a New Mexico dairyman raised his herd average by 1316 pounds of milk.

When roughage supplies nutrients much more cheaply than grain, which is the common situation, each cow's grain allowance should be based on the amount of milk she produces beyond the amount she can make from the roughage she is getting.

To illustrate, a normal-sized, mature Holstein cow can eat enough good-quality hay, or silage and alfalfa hay, to maintain her body and produce at least 24 pounds of milk. Such a cow needs only enough grain mixture for the milk she produces over the 24 pounds. Cows giving low-test milk require four-tenths of a pound of good grain mixture for each pound of milk produced.

Suppose a cow is giving 30 pounds daily. Such a cow would need grain for only 6 pounds of milk, or the difference between 24 and 30. The 6 pounds multiplied by four-tenths would be 2.4 pounds of grain mixture or the amount she would need daily. Now, suppose such a cow was being fed by the "thumb rule." Under this system, she would get 30 divided by 5, or 6 pounds of grain mixture, says Professor Anderson.

Now, calculate the needs of the cow giving 70 pounds of milk daily. Using the "thumb rule" and dividing 70 by 5, she would be fed 14 pounds of grain mixture. But by feeding according to her actual needs, she would

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get 18.4 pounds of grain mixture daily. This is arrived at by subtracting 24 from 70 and multiplying the difference (46 pounds) by four-tenths.

Thus, it is evident that the high-producing cow is very much underfed by the 1 to 5 method. That is why many highly-bred herds fail to produce as much milk as they are capable of.

Like any system of grain feeding, it may be necessary to vary the plan to fit the needs of certain individual cows in a herd. For instance, a good dairyman never feeds high-producing cows more grain than they can safely handle. If a cow fails to hold up in body weight, or milk flow, puts on too much flesh, or does not respond as expected, change the rate of feeding to fit her needs. It takes a lot of good cow sense in addition to a practical feeding system to get the most out of each feed dollar spent.

It Costs Less to Grow Big Yields

Why settle for less than 100 bushels of corn per acre?

That's the timely question posed by VPI agronomists who point out that it costs just as much to plow, harvest, plant, and cultivate to grow 30 bushels per acre as it does to grow 100.

On a typical farm, labor, tractor and machine use, seed cost, plus land rent will total about $35 for each acre. If the yield of the field is only 40 bushels per acre the cost per bushel is $1.10.

But by applying $20 to $25 worth of fertilizer, most producers can grow 100 bushels of corn per acre in a good season. This reduces the cost per bushel to 55 to 62 cents, with variations because of soils, previous treatment, etc.

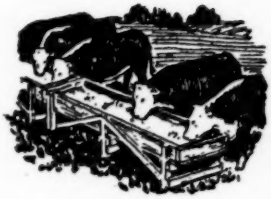
The agronomists say to choose fertile, well-drained soil, test it to determine lime needs, and prepare a good seedbed. The amount and analysis of fertilizer to apply will depend largely on that used on other crops in the rotation, the amount and quality of manure used, whether or not a legume crop immediately preceded and was turned under before corn, and the fertility level of the soil.

However, you can't expect high yields unless the soil has plenty of plant food.

Plant a corn hybrid adapted to the locality, about 10 days or two weeks after the average date of the last killing frost. Plant thick—at the rate of 14,000 to 16,000 kernels per acre for a full-season hybrid; or 16,000 to 18,000 kernels per acre for an early variety.

—Virginia Extension

Look What's Happening to Beef Feeding



A comprehensive report on major advances in feeding practices. Changes are coming fast and old methods are being junked . . .

Condensed from Better Farming Methods

W. M. Beeson, Purdue University

SCIENCE is replacing the "art" and "eye" of cattle feeding. Nutritional advances have made cattle rations complex and efficient.

Advances in cattle nutrition got off to a slow start but recent study of bacterial flora in the rumen has led to a new concept. These studies revealed that part of the "key" to feeding cattle was to provide the necessary nutrients for lush bacterial life in the rumen.

Advances in the field of beef cattle feeding and production in the next 20 years will be unparalled in the history of the cattle industry. I hope that this article will serve to re-emphasize that "research is the way to permanent progress."

Let's take a brief look at some of the major accomplishments in the feeding of beef cattle.

Use of Hormones in Beef Rations

Approximately 75 per cent of cattle in feed lots are either implanted or fed stilbestrol. Numerous research studies have shown that either feeding (10 mg. daily) or implanting of 36 mg. of stilbestrol at the base of the ear will improve daily gain approximately 16 per cent and feed efficiency on the average of 12 per cent. Cattle on fattening rations respond the same to implanted or oral feeding of stilbestrol. On pasture, cattle respond much better to implanting than to oral feeding stilbestrol.

Results at Oklahoma State University have shown that implanting range calves at 90 days of age with 24 milligrams of stilbestrol will increase the weaning weight of beef calves from 34 to 53 pounds. In both heifers and steers, feeder grade was nearly 1/3 of a grade higher for the implanted calves. Creep feeding 5 mg. of stilbestrol daily to suckling calves did not improve daily gain.

Numerous experiments have

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shown that implanting 24 mg. of stilbestrol in yearling steers going on pasture will increase the daily gain about 20 per cent or produce 40 to 50 pounds extra gain during a normal grazing season.

Steers fed grain on pasture will respond markedly to implanting with 24 mg. of stilbestrol but little or no response was obtained from oral feeding.

Tests conducted at college experiment stations have shown that feeder cattle previously implanted with stilbestrol will respond to a second implant of stilbestrol or to oral feeding.

Critical tests have shown that a stilbestrol implant of 24 to 36 mg. lasts about 5 to 6 months and after this period steers can be retreated with stilbestrol and a second boost is obtained.

Effect of Tapazole On Feed Efficiency

Tapazole is a very potent antithyroid agent and is used to treat hyperthyroidism in humans. A report from Iowa indicated that feeding 200 to 600 mg. of Tapazole daily to cattle would increase gain and feed efficiency above the effect of stilbestrol.

Gain differences were rather marked for the first 79 days but tended to taper off as the feeding period progressed. Experiments reported from other stations have shown no stimulation from Tapazole under their feeding conditions. The application and possible use of Tapazole is still in the experimental stage.

Antibiotics in Beef Cattle Rations

The use of antibiotics in beef cattle diets has grown slowly but steadily. The screening of many antibiotics has shown that the two most effective ones at the present time are aureomycin and Terramycin.

Under certain feeding conditions the oral feeding of 70-80 mg. of either of these broad spectrum antibiotics will increase the daily gain and improve feed efficiency and carcass quality of cattle.

Phosphorus shortages in corn interfere with pollination. Ears are small and are often twisted with part of entire rows of kernels missing.

Antibiotics are additive in their effect over and above stilbestrol and tend to counteract the slight depression in carcass quality that is obtained by stilbestrol. Antibiotics are most widely used in commercial feed lots and have not been universally adopted as yet by cattle feeders. It costs less than one cent per head daily to feed an antibiotic and the return in feed lot performance, carcass quality and health of the animal far surpasses the cost.

Antibiotics are also used effectively at high levels (350-500 mg.

per head daily) to control shipping fever. Many conditioning feed supplements are now being manufactured to be fed for 7 to 21 days after cattle arrive on the farm. Although this does not entirely prevent the onset of shipping fever, it tends to reduce the severity.

Tranquilizers in Beef Cattle Rations

The impact of tranquilizers on the various phases of cattle production is still in the experimental stage. Feeding 2.5 mg. of hydroxyzine (Tran Q) to steers along with stilbestrol and Terramycin has increased daily gain on an average of 12 per cent and improved feed efficiency 10 per cent. This is over and above the effect of stilbestrol and Terramycin.

Also, tranquilizers are being used to reduce the shock of shipping and weaning of calves. Many tranquilizers are being tested—namely, chlorpromazine, perphenazine, reserpine, Rauwolfia, meprobamate, and several others—to determine their use in life cycle of cattle production. The tranquilizer age is just beginning.

Other Feed Additives

Many other nutritional factors and feed additives have been tested in beef cattle rations with inconsistent or negative response. Research data reported to date has indicated that the addition of arsenicals, active dried rumen concentrates, live cell yeast, dried brewers yeast, fish solubles, and dried molasses solubles will not improve gain, feed efficiency or digestibility of nutrients for beef cattle.

Arsenicals fed at varying levels have not improved the feedlot performance of cattle.

Alfalfa Meal in Beef Cattle Rations

Dehydrated alfalfa meal contains some unknown factor which stimulates gain and improves the utilization of feed by cattle on both growing and fattening rations. Cattle require a minimum of 0.5 lb. of alfalfa meal per head daily, and many feeders are using 1 to 3 pounds of alfalfa meal or pellets to improve their cattle rations.

Agronomists urge buying fertilizer on the basis of cost per pound of plant nutrient. A 4-12-12 or 5-10-15 fertilizer is a much better buy than a 4-8-6 or a 4-8-8 because it is cheaper per pound of plant nutrients.

This discovery has increased and improved the utilization of poor quality roughages in cattle rations. No longer do we have to depend on farm-produced hay of varying quality to furnish sources of unidentified factors for ruminants. Now we can produce and furnish a standard product. Dehydrated pelleted rough-

ages of all types will be more abundant in the future. Weather will cease to play a part in preserving roughages.

The Bloat Problem

Many theories have been proposed for the cause of bloat, but it still remains one of the major problems when cattle are grazed on pastures that are high in legumes.

Major advancements have been made in certain areas to control bloat. Feeding 75 mg. of either penicillin or Terramycin per head daily to cattle tends to reduce the amount of fermentation and gas formation in the rumen and will, in most cases, prevent bloat.

Basic research has shown that the feeding of oils to cattle either on pasture or in dry lot will tend to prevent bloat, and methods are being developed now to include certain types of oils in the drinking water.

High-Moisture Corn for Beef Cattle Rations

Sealed storage under oxygen free conditions offers a method of preserving corn with high-moisture content (28-32 per cent water) without loss of feeding value for cattle. High-moisture ground ear corn stored in a sealed silo (Harvestore) has 10 to 12 per cent more feed value per unit of dry matter than low-moisture ground ear corn for fattening beef cattle. The changing mood indicates that corn will be harvested by picker shellers or picker grinders and stored in a sealed structure ready for push-button feeding.

Pelleting of Beef Cattle Rations

Research reports from several experiment stations have shown that the pelleting of poor grade hays and other roughages will increase the consumption by ruminants, and improve the daily gain and feed efficiency.

Pelleting high-energy diets has not improved the daily gain of cattle but, in some instances, has increased the feed efficiency about 14 per cent. A recent test at Purdue has shown that the pelleting of a diet containing 70 per cent corn cobs and 30 per cent concentrate improved the daily gain from 1.57 to 1.98 pounds, and the steers on the pelleted rations required 14 per cent less feed per unit of gain. Similar diets containing 20-45 per cent corn cobs showed no improvement in daily gain or feed efficiency.

There is a great interest in the pelleting of all types of roughages such as sorghum silage,

RANCH REMEDY

For cowmen's insomnia
The best cure, I've found,
Is knowing there's plenty
Of grass all around!
—By S. Omar Barker in Western Livestock Journal.

corn silage, etc.; and many large feed lots will adapt this method for their cattle feeding operations. Pelleting has gained in popularity in the formation of supplements for beef cattle. Cattle will usually eat pelleted feed much quicker than they will meal, and it also permits the simultaneous feeding of nutrients in a condensed form.

Although the fundamental reason is not known, it appears that diets high in fiber are more adapted to pelleting than those high in energy. Condensing a bulky feed like hay allows the animal to consume more, permitting a larger intake of nutrients above maintenance requirements.

One bacillus (bacteria) when conditions are ideal, may produce 16½ to 18 million other bacillus in a 24 hour period.

Self Feeding of Beef Cattle

Years ago the standard method of feeding cattle was on a hand-fed basis with grain, supplement, hay, and minerals. Self-feeding is becoming more popular among cattle feeders because it permits the simultaneous feeding of a balanced diet; allows the cattle to go on full feed the first day; and saves labor.

Research at Purdue has shown that cattle can be placed on a full feed at the beginning of the fattening period by feeding a complete mixture of eight parts of ground ear corn and one part of Supplement A (see table 1).

TABLE 1 — PURDUE CATTLE SUPPLEMENT A FORMULA
(32% Crude Protein)

Ingredient	1000 Lb. Mix
Soybean Meal	650.5
Molasses	140.0
Alfalfa Meal (Dehydrated)	140.0
Bonemeal	52.0
Salt with Cobalt (1)	17.0
Vitamin A and D Concentrate (2)	0.5
	1000.0

(1) One ounce of cobalt sulfate is added per 100 pounds of salt.

(2) Stabilized dry Vitamin A and D concentrate containing 4,540,000 U.S.P. units of Vitamin A and 567,500 U.S.P. units of Vitamin D per pound. For breeding cows, add 1.5 lb. Vitamin A and D concentrate per 1000 lbs. of mixture.

Through years of research it has been found that cattle usually go off feed because of an unbalance of nutrients and not due to an excessive intake of concentrate feed. Combining the proper ratio of concentrates to roughage as well as the essential nutrients tends to keep the rumen in the proper shape for maximum feed utilization.

Self feeding complete mixtures will increase on the farm, especially since we have to include so many nutrients to balance cattle diets.

Prior to 1954, it was thought that cattle could not be fed on a free-choice, cafeteria system. It has been shown through research at Purdue that cattle will do ex-

ceptionally well when fed free choice on ground ear corn, Supplement A, hay, and minerals. The cattle eat an excessive amount of supplement which makes this practice rather uneconomical, but it does show that the excessive intake of protein supplement even at the rate of 5-7 pounds per head daily does not upset the digestive mechanism.

In order to control the supplement intake, salt has been incorporated at levels of 5 to 15 per cent for free-choice feeding with corn. The more palatable the competing feed, the less salt required to control the supplement intake. Under range conditions, many experiments have shown that you can incorporate 25-33 per cent of salt with a supplement to control the intake. This is now a common practice where only a limited amount of supplement is required to balance the diet.

Range Supplements For Beef Cattle

Range grasses are known to be low in protein, Vitamin A and phosphorus for many months of the year.

Research at the U.S. Range Livestock Station, Bozeman, Mont., has shown the benefits of adding phosphorus and Vitamin A to a protein supplement. A 20 per cent protein supplement was fortified with one per cent phosphorus and 5,000 I.U. of Vitamin A per pound. At the end of the winter range season the calves on the fortified pellet were 24 pounds heavier. This illustrates the effect of adding a small amount of phosphorus and Vitamin A.

Range supplements should be balanced to protect animals against nutritional deficiencies. In addition to protein, dry range grasses are usually deficient in phosphorus and Vitamin A. The use of dehydrated alfalfa meal to supply sources of unidentified rumen factors would be helpful.

Mixed Supplements vs. Soybean Meal

For many years the standard practice in the feedlot was to feed either straight soybean meal, cot-

Last year, the average American church-goer gave 64c per week to his or her church.

tonseed meal or linseed meal to cattle. This era is steadily but surely becoming a thing of the past. Research has shown that in addition to protein, cattle need other nutrients to balance the deficiencies of the average feed lot ration.

The most critical nutrients and additives in a good cattle supplement are: (1) Good source of protein; at least 2/3 of the protein content from natural plant origin, (2) alfalfa meal (dehyd-

rated) for unidentified growth and rumen factors, (3) molasses —readily available source of energy and palatability, (4) dicalcium phosphate or bonemeal to supply adequate calcium and phosphorus, (5) salt for sodium and chlorine, (6) cobalt for synthesis of Vitamin B^{12}, (7) Vitamin A to protect against a deficiency, especially with poor-quality roughages. The formula for Purdue Cattle Supplement A supplies these nutrients.

Research at Purdue has shown that a mixed supplement balanced according to the nutrients outlined above is superior to feeding soybean oil meal to balance a fattening ration for steers.

1908 vs. 1958 Rations

The proof on any and all true advancements in feeding is the animal response. In order to demonstrate the value of our 1958 nutritional "know how," one set of identical twin Hereford calves was fed on a typical 1958 ration. Statistically speaking, data from one set of identical twin calves is equivalent to feeding 10 to 20 steers per lot.

These calves were exhibited at the International Livestock Exposition from November 28 to December 5, 1958 to show the living results of 50 years of progress in cattle feeding. The twin fed the 1958 ration gained 42 per cent faster on 30 per cent less feed at 33 per cent less cost! Proof enough that research is the way to permanent progress in beef cattle feeding.

Plan Your Fertilizer Program Around a Soil Test

An inventory of your soil now will provide a basis for planning a fertilizer program which will supply needed plant nutrients and help your crops produce nearer their yield potential.

A soil test will give this inventory by determining the level of usable nutrients in the soil, says Bill Bennett, extension soil chemist who is head of Texas A&M's soil testing laboratory.

"Soil tests are somewhat like finding out your bank balance," Bennett said. "If it is low, it should be replenished. If it is well filled, you're in good shape."

Slowly available nutrients which are not available now but will be in the future are important as well as readily usable nutrients, Bennett pointed out. Fertilizer recommendations based on soil tests take both forms into consideration.

Farmers should plan now to take inventory of their soil by getting a soil test. Local county agents can provide advice and assistance in taking a soil sample and submitting it for testing.

Swine Profit Keys

These 1958 Minnesota Honor Roll winners averaged 10.4 pigs weaned, 9.2 marketed. They tell here how they did it . . .

Condensed from The Farmer

Robert G. Rupp

HEAT lamps, antibiotics and creep feeding — those are essential to getting big litters of pigs to market in short order.

Those three proved management practices were listed by all 24 of this year's Minnesota Swine Honor Roll winners.

Other than those points, the group varied. Ten felt guard rails were important to saving pigs in pens; while the rest didn't use them. Twenty treat their hogs for mange, with only three not.

Seventeen raise hogs on concrete, evidence of a growing trend toward speeding gains through confinement rearing, plus the need for shifting land out of pasture into higher-return row crops.

Don't Wean Early

Seventeen vaccinate for cholera, with 15 using modified vaccine. Only 11 vaccinate for erysipelas, however.

Eleven use farrowing stalls.

The group doesn't believe in weaning pigs too early. Nine wean at six weeks, seven at seven weeks, and seven at eight. Only one weans at five weeks.

Fifteen of the master swine raisers are now using an injection form of iron for anemia control. Fourteen felt the iron shots were satisfactory.

"This group is outstanding for adoption of improved practices in swine production," says R. J. Meade, secretary of the Minnesota Swine Producers Association, one of the honor roll sponsoring groups along with the Minnesota Agricultural Extension Service.

"Their adoption of current practices and recommendations resulted in an average of 10.4 pigs farrowed from an average of 18 sows per herd," continued Dr. Meade. "They weaned 9.2 pigs and marketed nine per litter. Average market weight was 214 pounds at an average age of 174 days."

At least ten of the group multiple farrows to divide pork production more evenly throughout the marketing year. Six have or are building new swine facilities

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to practice "life cycle" production, including drylot finishing.

The master producers are picking meatier hogs for breeding. One marketed 80% of his '58 spring pigs at No. 1's.

Earl Prigge, Goodhue, Minnesota, top man in pigs raised, marketed 10.6 per litter.

Two farmers tied for fastest gains with 1.4 pounds-per-day average from birth to market.

How They Got Fast Gains

What are the keys to such speedy production?

"Keep the baby fat on pigs," says William Koniarski, one of the winners. "Start with the sow. See that she has plenty of protein throughout gestation so she can produce big, strong pigs. Then get the pigs off to a good start. If you can do that, you've got an awfully good edge on getting them to market in a hurry."

"Start with a good, growthy gilt and a good boar, then never let anything slow pigs down. Feed sows carefully and watch their weight during gestation, so they don't get clumsy. Get pigs eating as soon as possible and make sure they have plenty of clean water. They will drink as soon as they will eat. Give them an iron injection for anemia. That seems to help start them eating."

"The breed of hogs used and feed are both important to fast gains," says young Wallace Molitor, also a winner. He used a three-way cross — Duroc-Hampshire sows and a Landrace boar— and followed a commercial feed program to get his 1.4 pound daily gain. "My pigs are on full feed every day they're on the farm," says Leo Moehnke, Stewartville, who uses a Yorkshire-Berkshire-Minnesota No. 2 cross.

What are other keys to getting big litters?

"Save sows from big litters," answers Oscar Struxness of Milan, Minnesota, who averaged 10.1 pigs raised. "Catch sows in the second heat, rather than the first," says Martin Annexstad, Jr., St. Peter, who averaged 9.9 raised. "Wean three sows every third day so they won't all come into heat at once, then pen breed; take one sow to the boar in the morning, another at noon and the third at night."

"Save good sows as long as they will produce," says Merwin Miller, who averaged 9.7 marketed. "Some of my sows are coming with their eighth litter, some with their seventh, and the rest with their fourth. If you watch sows' weight and make sure they get plenty of exercise you can get bigger litters that way."

"Use heat lamps," was the answer of 23 of the 24. "Farrowing stalls," said 11; "guard rails," said 10.

"Be with sows at farrowing,"

answers Levern Wilker of Owatonna. "Save gilts from mothers that are quiet and good natured during farrowing," says Oscar Struxness. "Don't use too much litter in pens," says Harold Hotzler of Heron Lake. "Avoid drafts or chilling which will make pigs pile up," says Cletus Franta of Lafayette.

What are other keys?

Here are management tips, gleaned at random from the Minnesota blue ribbon producers:

"I want gilts a year old before they farrow," says William Koniarski. "I like to have them good sized so they've got room to develop big pigs. Get needle teeth clipped as soon as pigs are born. If you don't they'll bite one another and the sow. She will become irritable during nursing and may jump up, crushing a pig."

"Production tested boars are a new efficiency factor we have today which shouldn't be overlooked," says Martin Annexstad, Jr. "Using production tested boars, whether they come from on-farm testing or a testing station, is a coming 'must' in the hog business."

Provides Two Sources of Iron

"Fresh sod, given pigs as soon as they are born, plus an iron shot at three days of age gives excellent anemia control," reports Oscar Struxness—a point which is repeated by several others. "The injection method is a little more expensive, but you're sure pigs have their iron that way," adds Levern Wilker.

"Don't forget sanitation," says Merwin Miller. "I spray the bottom area of my hog house before farrowing so anything pigs come in contact with will be clean." He uses lye and water to scrub the house first, then sprays pigs and sows at six weeks with diluted benzine hexachloride, and again 30 days later, this time with the BHC at full strength.

"I provide shade for hogs during summer heat by laying poles across a couple old wagons and covering them with straw," says Howard Gaffney of Renville. "A lawn sprinkler running onto a concrete floor keeps hogs cool in summer for me," adds Leo Moehnke of Stewartville. Shade and a bathtub, made of 10-inch planks, does the job for Martin Annexstad, Jr.

Gordon Gieser of Winnebago left slots in the edges of his concrete feeding floor. In the summer he inserts 2 x 6 poles in the slots to hold water and shade on top. Melvin Rachuy of Westbrook fences a lane from his hog pasture to a grove to get hogs under shade. When his field arrangement won't permit that, he builds portable shade.

"Farmer's Lung" An Occupational Disease

Report on a major farm health problem is found in this article written by a doctor . . .

Condensed from Michigan Farmer

Dr. M. G. Fisher

"FARMER'S lung" is an occupational disease that recently has been getting considerable attention. The disease isn't common, but farmers should know about it. Information furnished by a patient to his doctor would help greatly in making a diagnosis.

The disease is caused by working in dusty places with dry, moldy stored hay, grain, fodder and silage. It is rare in the summer and more common in winter when stored fodder and other feeds are used in closed barns.

Symptoms of farmer's lung are shortness of breath, cough, fever up to 104 to 106 degrees, and blood-streaked spittum. Often there is severe headache and there may be shaking chills. All these symptoms could suggest pneumonia, flu, or other respiratory infections. That's why it is important for farmers to know that such a disease exists.

In most patients, dusty farm work is followed in a few hours by shortness of breath, cough, fever and chills. In chronic cases, weight loss of 10 to 20 pounds is common. Two Wisconsin doctors, Dickie and Rankin, reported on 39 cases of farmer's lung in the Journal of the American Medical Association last summer. Their patients were seen over a period of 8 years in a dairying region. Many of the patients had received previous care when the proper diagnosis was not made. This is understandable because of the confusing symptoms.

Some permanent lung disability can result from a first attack. Symptoms and damage will increase with repeated exposure. The dusts most often blamed are produced by moldy hay, grain, and silage. Apparently the fungal spores in the dust are responsible for the disease.

It is interesting to note that in a group of people exposed to the same dust at the same time, some develop the disease and others are not affected.

Investigators tell us that farmer's lung is caused by inhaling spores which act as an irritant on the lung. It is not an infection, but more like an allergy. Some people are more sensitive to

Reprinted by permission from Michigan Farmer, 322 Abbott Road, East Lansing, Michigan

certain molds than others. This explains why one farmer can work in the dust and show no symptoms, while another develops the disease.

Farmer's lung is distinctly different from "silo-filler's disease." Silo-filler's disease is caused by a poisonous gas formed by the fermentation of green silage. Symptoms come on very shortly after exposure to this gas, and usually last 10 to 14 days. Patients sensitive to the molds causing farmer's lung may have symptoms over a period of years if the diagnosis is not made and exposure to dusts not stopped.

Treatment of farmer's lung with antibiotics is of no value. The most urgent thing is early diagnosis. Continued work in a dusty situation can cause lung damage so severe that manual labor becomes impossible even away from the dust.

Diseases May Be Future Weapon Against Insects

The day may be coming when man wages biological warfare against insects.

Marion Brooks, University of Minnesota entomologist, says diseases could become useful weapons for controlling insect pests. But diseases used this way would not affect humans at all; they would be maladies that confine themselves to insects only.

Scientists have already used a number of disease organisms this way. So far, however, there are some major obstacles to pitting diseases against insects, Miss Brooks adds. First, it's difficult to produce the organisms that cause the diseases. This usually calls for raising live insects, innoculating them with the organisms and recovering them when the insects die. This is tedious and expensive.

Second, there are problems in putting disease organisms in the right place at the right time. Diseases won't develop properly under certain weather conditions. And third, the insect population itself needs to be dense, in order for a disease to spread from one insect to another after it's introduced.

Despite the roadblocks, Miss Brooks thinks there's a promising future in insect control through diseases. Much research is needed on this approach, she says, but where it can be done, it's usually cheaper than chemical control. It is less dangerous to man, domestic animals and birds and is less harmful to insect predators. Diseases that attack insects seldom affect other living things. Also, once a disease is established, it may perpetuate itself in the soil, on foliage or may be transmitted through eggs. If so, it may not need to be introduced again. —*University Farm & Home News*

Bungling Bees, Intruding Weevils Impede Scientists

Mass-produced hybrid cotton may be five years away . . .

Condensed from The Wall Street Journal

James C. Tanner

THIS is all about the bees and the flowers, and the rather anguished attempts of agricultural scientists to regulate the love life of plants.

The scientists haven't been too successful at it, one should note. Some bees have bungled and the seeds have not seeded as planned.

What the researchers are trying to do is perfect a method to cross-breed the cotton plant on a commercial basis. This would, among other things, give cotton growers an opportunity to scientifically mate superior types of plants and thereby improve quality and increase yields.

Adding to the Pile-Up

Not that there is any shortage of cotton. At last check, close to 8,000,000 bales of the price-supported fibre were clogging private and Government storehouses. And if some of the 20-or-so cotton cross-breeding experiments going on prove successful, the pile-up might become even more burdensome for Federal farm planners. Still, there are some good reasons for trying to lift yields. Higher yields almost certainly would reduce cotton grower's costs. In any case, scientists insist, this is the path of progress and there is no turning back.

Many successful hybrid species have been developed in the agricultural world, of course. Corn and grain sorghums, for instance, come immediately to mind. Cotton plants have been cross-bred, too, but only after a tedious, time-consuming process and only in non-commercial amounts, mainly because the peculiarities of cotton plant reproduction do not rapidly permit scientific control.

To accomplish their ends, the scientists are turning to the bees and a chemical called sodium 2,3-dichloroiso-butyrate (FW450, for short), a Rohm and Haas product developed three years ago as a weed killer but now going into more productive activities.

To understand the problem,

Reprinted by permission from The Wall Street Journal, Chicago 90, Illinois

one must first understand the workings of the cotton plant.

The Bees Help Out

Like all other plants, cotton contains reproducing units within itself. It differs from others, though, in that the male and female cells develop on each of the creamy-colored flowers the plant produces. This means that most cotton plants in-breed; that is, variations in the offspring do not occur as often as, say, in corn or garden flowers where external forces (wind, or pollen-carrying bees) help out and, in a haphazard way, mate different varieties of the same kinds of plant.

From a commercial viewpoint, some cotton plants produce far more usefully than others. So there is much to be gained if certain strains can be controlled and mated to produce desired offspring—one, for example, that has longer-than-normal fibre.

But commercial breeding is a laborious process. To begin a new strain, for example, a breeder has to alter the reproductive system of one plant and manually introduce into it pollen from another plant. After such intermingling a decade of selective planting may have to go on before the breeder can confidently market the new seed.

Now, however, there may be a short-cut.

Rohm & Haas plant physiologist Frank Eaton, now with the University of California, found in greenhouse tests that spraying FW450 on cotton prevented the development of normal pollen. The sterility occured mostly in male cells. This suggested that cotton plants might be cross-bred on a large scale by using the chemical and then introducing pollen from other plants.

The Lure of Alfalfa

This is where the bees come in.

Bees, as every school boy has been instructed, carry pollen when they flit from one plant to another and thus do their part in cross-breeding. But bees, it

Over 1/3 of the surface of the earth never receives any snowfall.

turns out, often are notoriously undependable.

One commercial breeder, for example, went to some pains to spray portions of his cotton field in California's Imperial Valley. He then freed several hives of bees. But the bees, lured by some nearby alfalfa, simply ignored the cotton patch—and the experiment collapsed.

Then, too, well-meaning breeders who've gotten involved in these cross-breeding attempts have found themselves bumping into the boll weevil problem. The fields have to be doused with insecticides to kill off weevils and

other insects. The trouble is the insecticides also kill off the bees.

"There's still much research to go," observes Robert R. Coker, president of Coker's Pedigreed Seed Co. in Hartsville, S.C., "but when the techniques are worked out, they'll make a substantial contribution to the cotton economy."

Mr. Coker, and many other cotton seed breeders, believe that mass-produced hybrid cotton still may be five years or so away. But when the time comes, they predict they'll be able to offer seed with better-yielding characteristics and bolls which will be easier to harvest.

"There's no reason why we wouldn't be able to tailor cotton to a certain producing area," insists one cotton scientist. "We might even be able to make the fibre length precisely what the buying mills want it to be."

There are a few scientists who claim they already have produced hybrid cotton seeds through the chemical-bee process but most are unwilling to talk publicly about it because testing still is going on.

Young Pigs May Suffer from Anemia

Young, rapidly growing pigs may become anemic and even die if they don't get enough iron and copper to make hemoglobin and red blood cells. Red blood cells, which contain hemoglobin, carry oxygen to all parts of the body. Pigs must build new cells to replace those that have worn out or they will die from anemia. If their diet is deficient in necessary minerals to make the new cells, they are in trouble."

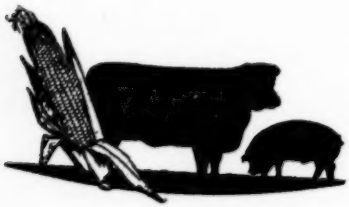
Pigs that can root in the soil, which is a good source of iron and copper, seldom are affected. But pigs raised on concrete or wood floors are more susceptible to anemia.

A good step to prevent losses from pig anemia, is to paint a solution of copperas (iron sulphate) on the sow's udder or to dose the baby pigs with it according to directions by a veterinarian. Swine growers can also put a couple shovelfuls of dirt in the pen. To avoid bringing worms and disease into the herd, be sure the dirt comes from an area where there have been no pigs before.

Injectible iron-dextran has been used widely by livestock owners. This product seems to be effective and is applied by many veterinarians.

Neglect of these precautions can result in the development of weak, unthrifty pigs, and frequently is either the direct cause or at least a contributing cause of deaths.

Livestock Feeding Enters A New Era



Sealed storage and automatic feeding are here to stay . . .

Condensed from Indiana Farmer

Fred Myers

TEN years ago, the idea of sealing or "canning" silage and grain in an expensive glass-lined tower seemed out of place. After all, farmers had preserved silage in conventional bunk silos for years.

However, three factors helped change this idea. First, spoilage was wasteful. Second, farmers were well aware that labor was at a premium. Any device or practice that would cut time and labor costs was welcomed with open arms. Third, livestock markets began leveling out. Hog producers, particularly, began marketing year 'round rather than during a few months of the year.

Consequently, sealed storage came into its own about 1951. Since that time, many farmers have found that it leads to a more profitable operation.

Only one manufacturer, the A. O. Smith Corp., is currently producing sealed storage units. These glass-lined and air-tight units are being sold under the trade name, Harvestore.

Advantages

Let's look at some of the advantages of sealed storage.

1. Forages can be stored at about 40 to 50 per cent moisture. This prevents shattering and leaf loss as with hay but results in palatability normally associated with silage. Also, lower moisture levels cut the amount of feed needed to provide any given amount of nutritive material.

2. Corn can be harvested earlier (30 per cent moisture) and stored or moist corn can be purchased during harvest periods when lowest prices prevail.

3. Sealed storage with bottom unloading lends itself to automatic feeding—almost a current necessity for any medium or large scale livestock feeding operation.

4. Space normally used for storage is reduced to a minimum. This cuts building and maintenance costs.

Now let's look at some typical

Reprinted by permission from Indiana Farmer, 725 Warren Street, Huntington, Indiana

sealed storage installations.

Beef

Hugh Boswell and his son, Bob, farm 325 acres in Miami County, Indiana. They are currently feeding about 150 head of beef cattle. One sealed unit contains haylage (an alfalfa, brome, timothy and orchard grass mixture stored at about 40 per cent moisture). Another unit holds shelled corn harvested at about 30 per cent moisture. Haylage is fed with an auger which delivers the feed to the bunk through the use of a tube type conveyor.

The corn, fed at the rate of about 13.5 pounds per head per day, is delivered to the auger through an elevator and portable scales. The scales provide an accurate method for determining the exact amount of corn fed.

All mechanized equipment is housed in a 22 x 30 foot shed built between the sealed units and the feed bunk. A movable metal plate in the floor is provided so that other feed material such as corn silage can be dumped directly from a wagon into the auger.

Boswell can handle up to 200 head of beef cattle at any one time. He plans to feed 50 per cent more animals this year than he did last year.

The animals are gaining about 2.5 pounds per day on their ration of corn and haylage.

Notable aspects of this operation are that corn is never handled by hand except when planted. In addition, total feeding time per day is only about 40 minutes. It's almost completely a push button operation.

Hogs

Paul Miller, Madison County, Indiana, operates a farm owned by Glenn Sisson. The major enterprise is hogs. Miller uses a semi-confinement system. He says, "I like to see them on ground just a bit even though there are times, especially in winter, when I would rather see them out in the mud." He and two helpers farm 462 acres. About 335 acres of this is in corn.

Recent tests show that yellow is the most easily seen color in the woods. Red, the color traditionally worn by hunters, ranks down the list in seeability.

One sealed unit—the first in Madison County—was erected in September, 1957. The second unit was placed in operation in March, last year. Both units, which are filled with shelled corn, will feed out the yearly turnover of 2,400 head.

Protein, formerly mixed with ground corn, is now fed free choice. This has cut unnecessary protein consumption by almost one-third with no reduction in weight gain.

Automatic feeding facilities,

an auger covered with a sheet metal roof, were constructed on the farm by Miller.

Feeding his 425 hogs now on hand is about a four minute job. He says, "I flip the switch, walk around the feed trough, turn off the switch and the hogs are fed for the day.

Dairy

Joe Schroeder has a dairy operation near Rushville, Indiana. It's strictly a one-man operation. His own 152 acres plus a rented 60 is supporting 60 cows and heifers.

Schroeder's sealed storage unit was installed in June, 1957. It handles about 530 tons of haylage per year. One filling supplies feed for about six months. Corn silage, which is stored in a conventional silo, is fed when the haylage supply is depleted.

Although Schroeder has been in the dairying business since 1940, he believes his new feeding facility is the first important step toward a highly productive enterprise suitable for operation by one man. He feels that mechanization is the real answer.

Schroeder is very enthusiastic about sealed storage from the standpoint of pasture usage. He figures that his cows wasted between 40 and 50 per cent of his pasture through trampling. This has been eliminated by harvesting the forage and feeding them directly from his sealed unit. His haylage is composed of alfalfa and timothy. Dry hay (4 to 5 bales) and grain (4 to 5 pounds per day per animal) supplements the haylage. He feeds as much haylage as the cows will clean up.

Schroeder's future plans include another unit, a concrete feeding area and feeding sheds.

Greater efficiency must be employed as agriculture becomes more competitive and production costs rise. Sealed storage units coupled with automatic feeding mechanisms are h e l p i n g to achieve this efficiency.

John Cherrinton at Oxford (England):—You can teach any sensible man to do anything with sheep in an hour.

If it were not for the Income Tax I would keep no books at all.

A secretary keeps one's wife up to scratch but has no useful farming purpose.

The good Scottish stockmen have spoilt the Blackface. The only decent blackface is now a Swaledale.

To hell with posterity: look after yourself.

To see a man with a tool in his hand cutting and laying a hedge drives me up the creek.

—*Farmer and Stock Breeder*

Calibrating Spray Equipment Important Farm Job

A simple, yet accurate, method of calibrating spraying equipment on the farm.

Condensed from
Vegetable Growers Messenger

Paul F. Young

SPRAYING has become as common as plowing and cultivation, however, most growers still have difficulty calibrating spray equipment.

The purpose of this article is to attempt to present a simple—yet accurate—method of calibrating spraying equipment for controlling insects, plant disease and weeds.

Many farmers become confused by charts, graphs and tables when they attempt to determine the amount of spray material being applied by an agricultural field sprayer. Their problem is further complicated if they need to operate their sprayer at a different speed, pressure or nozzle spacing than those listed in the tables.

Major factors to be concerned with in a field sprayer operation are:

1. Speed of sprayer.
2. Nozzle spacing.
3. Application rate.
4. Discharge rate per nozzle (depends on size of nozzle and operating pressure).

Values for these factors may be obtained in the field by following simple methods:

Speed of Travel

The speed of the machine can be determined as follows: Select the gear to be used and set the tractor throttle at the operating position. With the machine in motion, on average ground, drop a flag, (a stick or wrench will do) and exactly one minute later drop another flag. Measure the distance between the flags to determine the number of feet traveled per minute. The following formula will give you "Speed of Travel."

MPH equal distance covered in feet over seconds required to cover measured distance times 1.47.

Example: If 360 feet is traveled in 60 seconds, the speed is found to be 4 mph. MPH equals 360 divided by a figure found by multiplying 60 times 1.47.

Reprinted by permission from Vegetable Growers Messenger, Preston, Maryland

Like this: 360 divided by 60 times 1.47 (88.2) equals 4.07.

Nozzle Spacing

Nozzle spacing is usually a known factor: The nozzle spacing for close growing crops will simply be the distance in inches between the nozzles. The nozzle spacing for row crops will be the row spacing in inches divided by the number of nozzles required per row.

Rate of Application

The rate of application will depend on the concentration of the spray solution and the amount of active ingredients desired per acre. Follow recommended rates of application for the various types of spray materials.

Rate of Discharge Per Nozzle

Nozzle capacity in gallons per minute can be obtained from the manufacturer. If such data is not available use the following formulas:

To determine the gallons per minute per nozzle for blanket-type spraying (weed control), if the rate of travel (MPH) and total gallons required per acre are known:

Gallons Per Minute Per Nozzle equal MPH times nozzle spacing in inches times gal. per acre over 5940.

If nozzle spacing is 20 inches, this formula is simplified and becomes:

Gallons Per Minute Per Nozzle equals MPH times Gallons per acre over 297.

Example: What is the discharge per nozzle required for weed control in pastures if the forward speed is 4 mph, the nozzle spacing is 20 inches and 65 gallons per acre of spray solution is required to gain control?

To determine the gallons per acre required for each nozzle, divide the required gallons per acre by the number of nozzles being used. A full six row weed boom has 13 nozzles, so 65 over 13 equals 5 gallons per acre per nozzle.

The gallons per minute per nozzle equals 4 times 5 over 295 equals .067 gallons or 8.5 fluid ounces, or the gallons per minute per nozzle equals 4 times 20 times 5 over 5940 equals .067 gallons or 8.5 fluid ounces.

Off-farm income now accounts for about one-third of farmers' total net income, reports the U. S. Department of Agriculture.

To determine the number of pounds of pressure per square inch required to maintain this gallonage requirement, the following steps should be taken:

1. Install nozzles in sprayer boom.
2. Set tractor throttle in the position pre-determined for correct miles per hour.
3. Set the sprayer regulator at

approximately the pressure to be used in spraying.

4. Start spraying, catching the discharge from two or more nozzles in separate buckets for exactly one minute.
5. Measure the material discharged by each nozzle and compare this with the quantity needed (as determined by the above formula). If quantity discharged is too low, increase the pressure slightly and recheck. Likewise, if the quantity discharged is too high, decrease the pressure slightly and recheck.

Several settings may be required the first time a sprayer is calibrated but with a little experience, much less time will be required on later calibrations.

Gallons per minute per nozzle for row crop application can be obtained in this same manner by using the long formula — —

MPH times nozzle spacing in inches times gallons per acre over 5940.

Here are a few other formulas that help to simplify spray calibration:

To determine the gallons per acre the formula would be:

GPA equals 5940 times Gallons per minute per nozzle over Miles per hour times nozzle spacing in inches.

Example: We have predetermined our ground speed to be 4 mph and have been using a 20-inch nozzle spacing. Assuming that we know that the GPM of our nozzles is .067 at 40 p.s.i. (manufacturer's chart indications). What would our gallons per acre discharge be?

5940 times .067 over 4 times 20 equals 5 Gallons per acre.

To determine the acres sprayed per hour the formula would be as follows:

"Acres covered per hour can be computed by multiplying the swath width in inches by the speed of the tractor in miles per hour and dividing by 100."

In managing your hog program, about 10 days prior to farrowing, change the ration of your sows to one that is more bulky. This will help prevent constipation when she is penned for farrowing. Substitute ground oats or bran for some of the corn and supplement in the ration.

Example: If the speed of the tractor is 4 miles per hour and it is carrying 6 row equipment for spraying 6 rows spaced 40 inches apart, center to center, what would be the number of acres covered per hour?

Acres Covered Per Hour equals 40 inch row times 6 rows times 4 mph over 100 equals 9.6 acres per hour.

Filling and turning at row ends is not taken into consideration

in this last formula. However, using this formula and then subtracting the actual percentage of time lost in turning and filling will result in a fairly accurate "Acres per hour rate." This formula can also be used for mowing, rollamulching or any other operation involving field equipment.

An even simpler method of computing many of the problems discussed above, is to use a good, fool proof spray computer.

These spray computors are being put out by manufacturers of agricultural sprayers and are practically fool-proof in solving such problems as: 1—How fast the ground speed should be when swath width, pump capacity and gallons per acre is known. 2—How many gallons per acre, a pump with a given capacity, is capable of applying when the swath width and proper driving speed is known. 3—What size or capacity nozzle should be used when the swath width, gallons per acre and miles per hour is known. 4—Orchard spraying problems. 5—Air Row Crop spraying problems.

How to Boost Pig Profits

Hog producers can sharply cut pig production costs by reducing mortality. Studying the economics of feeder pig production on farms, it was found that about two-thirds of the pigs that died were either crushed by the sow or chilled. Many of these losses can be prevented.

Inputs or resources used in producing feeder pigs include variable cost items such as feed, labor, trucking, bedding, vaccination, medicine, and insecticides. Fixed costs include land, fencing, buildings and equipment in breeding stock, and taxes.

The total of these items less the value of breeding herd gain amounted to an average net production cost of $11.43 per pig. Pigs weighed 46 pounds when sold at an average of $17.92 a head. This leaves an average profit of about $6.50 per pig. However, unusually favorable prices prevailed last spring.

In the study, nine pigs were farrowed per litter, and an average of 6½ of these were weaned. This death loss is higher than expected under good management practices.

—University of Arkansas

Clean Hog Lots With a Pump

It's easier to pump than scoop manure, says this article. Other advantages are even greater . . .

Condensed from Farm Journal

Dick Braun

WHEN drylot hogmen get together these days, "shop talk" usually drifts to their biggest problem: cleaning out the manure. The 500-hog raiser had 500 manure spreaders, when he fed on pasture. But the four-legged models don't work so well on concrete. "You need some kind of a manure handling system or it'll drive you nuts," is how Everett Horine of Indiana tersely puts it.

As farmers usually do, hogmen have rigged up all kinds of ingenious ways to unstick that problem. Some are as amazing as they are new. But the important thing: They all work.

Hogmen have shown intense interest in drylot operations and manure handling methods that have been recently developed. So far they've centered mainly around the tractor scoop and the garden tractor with a blade. But the *hottest* idea to come along is to handle the manure in liquid form.

In this system you wash down the feeding floor and float the dirt into a pit. Then spread it with a tank instead of a manure spreader, and do it once a week or *month,* not every day. There's no fuss with bedding.

There are about as many ways to handle liquid manure as there are farmers who are doing it. But here are some general principles that most would agree upon:

Eliminate bedding. What a problem that solves! Hogs sleep uphill from the feeding area, so it's always dry. If you use bedding, be sure that you have a disposal system that will handle it.

Slope floors to outside gutter. Some have up to ½-inch of drop per foot. The more slope, the easier it is to move out the slush. Of course, you don't want so much slope that the hogs slide!

Gutter that leads to a pit. With inside feeding, the gutter usually runs down the center of the building or along one side near the feeding-watering area. For an outside feeding floor, it's either along an outside fence, or down the center where the floor

Reprinted by permission from Farm Journal, Philadelphia 5, Pennsylvania

slopes toward it from both sides. Gutters need to be wide enough so you can push the slush with a float or garden tractor blade. And deep enough so they won't overflow.

A holding pit large enough to hold at least a week's cleanings —more, if possible. Make it big enough because you may be raising more hogs in a few years. You need an overflow at the pit, and a tile that leads out to a wasteland area. Or, you can put in laterals for seepage into the soil. But then you'll need a catch basin so that solids which might get into the overflow will settle out before passing to the seepage tile.

A pit overflow is important because a big rain on an outside feeding floor puts hundreds of gallons of water into your pit. Quite a job if you have to haul all of that out.

Check county laws before you run the overflow into an open ditch that drains into a stream. Some anti-pollution laws are tough.

Good supply of running water. That is usually not a problem because most drylot operations have drinking water piped in. However, you may need a small reservoir and a "booster" pump to bring up water pressure. You will need at least 75 pounds of pressure per square inch and a water system capable of supplying 500 gallons an hour.

Tank to spread the liquid. Some pump out the pit with an irrigation pump; others pump vacuum into a carrier tank and suck out the liquid. Some farmers have used a grain auger, but that's slower because part of the liquid slips back down.

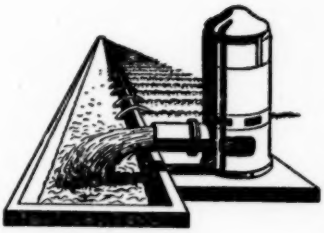
Slush runs from the tank by gravity, or you can use a sledge pump to unload. Some hogmen figure the value of watered down manure isn't great enough to worry about spreading. They simply gush it out of the tank. Others rig up a baffle that fans out the stream to cover a strip of ground three or four feet wide. Still others run it into a horizontal 4- or 5-inch pipe capped at both ends with holes drilled at the bottom so they get small streams running onto the ground.

If you'd rather handle solid manure, the latest way to mechanize that method is with a gutter cleaner.

In some "pork factory" operations where they farrow pigs in one end of the building and sell finished hogs out the other, one or two gutter cleaners run the full length of the building.

Either way, there's work connected with daily cleaning — a rather important must in drylot hog raising. And anything that mechanizes cleaning takes a big muscle load off your back, and helps you crank out more hogs per man.

Making Irrigation Pay



It isn't a sure and easy way to farm profits . . .

Condensed from
Michigan Farm Economics

C. R. Hoglung and *E. H. Kidder*

IRRIGATION is an important practice that has increased net income for many farmers. Yet some farmers receive little benefit from irrigation. Investments in irrigation equipment range from less than $1,000 to more than $50,000 per farm.

If farmers want to receive a high return on their investment in irrigation, they will need to make more use of better soil management and irrigation practices, getting the most good from the water they apply.

Use More Seed and Fertilizer

Some farmers fail to make top use of irrigation because they do not use enough seed or fertilizer.

A Southern Michigan potato grower who owns an irrigation system uses very little more seed and fertilizer than he did before irrigating. His potato yields have been increased by only 40 bushels per acre. The per-acre costs of owning and operating the irrigation system add up to more than $40.

However, 1957 study of two groups of successful potato growers showed the irrigators were using 25 per cent more seed and 60 per cent more fertilizer per acre than the non-irrigators. Potato yields were 132 bushels more per acre when irrigated.

Use Labor Effectively

The labor force on a farm affects the profit from irrigating crops. For high-value crops like strawberries, truck crops, and potatoes, it usually pays to hire all of the labor needed to move pipe, especially on larger acreages.

The number of irrigation laterals in use and the nature of the crop both affect labor needs.

In irrigating corn, pipe is not usually hand-carried from one lateral setting to another because the corn is too high.

Yield Response and Crop Value

Whether or not it pays to irri-

Reprinted from Michigan Farm Economics, published by Michigan State University, East Lansing

gate a certain crop depends on both the yield increase and the relative price of the product. Comparing the value of the extra yields expected from irrigating two crops, such as potatoes and oats, shows that a 160-bushel increase in the yield of potatoes adds about $160 to gross returns.

The costs of owning and operating an irrigation system, plus the extra seed, fertilizer, labor, and harvesting costs would total $100 an acre for the potatoes. This would leave $60 returns above these costs.

Even a 30-bushel increase per acre from irrigating oats would add only $21. Irrigating oats would cost $30 an acre. It is easy to see that irrigating oats and other low-value crops does not pay.

Irrigation of corn is most likely to be worthwhile on the sandier soils.

When corn grown on medium water-holding soils is irrigated, yields may increase by only 25 to 30 bushels.

With present costs, corn would need to sell for about $1.40 a bushel to make a profit from irrigating corn grown on the medium water-holding soils. Under large-scale operations, irrigation of corn on the sandier soils would pay for many farmers if corn sold for as little as $1 per bushel.

There is little question about the profits you can get by irrigating high-value crops such as strawberries, sweet corn, potatoes, and most truck crops—when improved practices are used with irrigation. Better quality and higher yields result when fruits and vegetables get moisture when it is needed.

Investment in Water Supply Important

Source and location of the water supply make a difference in the cost of irrigating different crops. The farmer who has a good source of surface water nearby, such as a stream or reservoir, usually has the lowest cost.

Strawberries and most vegetable crops can carry the higher costs of getting the water from wells. A low-cost water supply is usually needed to irrigate corn and legume-grass pastures at a profit.

The amount of milk used in the manufacture of cheese and frozen dairy products has increased considerably in the past 30 years. These two groups of dairy products now take about 20 per cent of all milk sold by farmers compared with about 12 per cent in the mid-1920's.

Grain Banks Save You Labor

Time and labor saving systems of handling feed are welcomed by the livestock farmer. This system may fit your farm operation . . .

Condensed from Wallace's Farmer

Dick Hagen

MOVING grain from field to feedlot is a big job for livestock producers. A new approach —the grain bank system—is making the job simple.

What is the grain bank? Primarily, it's a feed handling service.

Under this arrangement, the farmer delivers grain to the feed mill at his convenience. Then, the mill mixes the grain with the specified supplements and delivers the mixed feed into the farmer's feeder.

Limits are set on amounts each farmer sells into the grain bank. Most elevators specify from 500 to 1,000 bushels, or no more than a 30-day feed supply. Providing storage for extra grain a farmer may have is not the purpose of the grain bank.

Deliveries are credited to each farmer's account. Corn rates of 2 cents per pound or one dollar per bushel are often used. When the farmer orders feed, the corn is sold back to him at the same rate. His account is rebalanced. This gets around the need for warehouse receipts.

What are the charges for this storage, mixing, and delivery service? Costs vary, of course. But here are some of the typical charges:

Hauling corn to the feed mill (if the farmer does not do this for himself) .....3-5c per bu.
Drying (if needed) ...5-10c per bu.
Storage and handling ..1-3c per bu.
Grinding and mixing 10-15c per cwt.
Supplement added ....current price
Delivery feed (depending upon distance and size of load ....$1.50-$3.00 per ton

Doing your own grinding and mixing may be cheaper. Particularly if your ground feed volume is big enough and labor is no problem. Interest, depreciation, taxes, repairs, and operating costs of a hammer mill are part of this picture, too.

W. S. Farris, Purdue University economist, figures on-the-farm grain handling costs from field to feedlot as follows:

Ear corn .....31.3 per bushel
Shelled corn .....30.5 per bushel

These costs are based on 10,000 bushels of corn. They include harvesting, hauling, elevating, drying, shelling, storing, grinding, mixing, and feeding.

So total costs for 10,000 bushels

Reprinted by permission from Wallaces Farmer, 1912 Grand Avenue, Des Moines 5, Iowa

run from $3,050 to $3,130. Converting grain to ground feed counts up.

Grain bank charges for a similar feed volume run about like this:

Hauling (farm to feed mill) at 3c per bushel .....$	300.00
Drying at 7c per bushel ..	700.00
Grinding and mixing at 15c per cwt.	840.00
Storage and handling at 2c per bushel	200.00
Delivering feed at $1.50 per ton	420.00
Total	$2,460.00

On-the-farm costs for harvesting, shelling, handling, and storage may add another $1,500. This makes the total under the grain bank system come to about $3,960. So owning a farm grinder and mixer can be justified on a volume basis.

But grain bank patrons point out advantages offsetting extra costs.

"Anyone who has scooped a lot of corn will probably go for this labor-saving service," says Raymond Fisher, farmer in Green County, Iowa.

"Our hogs seem to do better on mixed feeds than when self-fed corn and supplement. It's hard to do a good job of mixing with our farm mill. With the modern, highly-fortified rations, proper mixing is essential."

Time saved is a big advantage of the grain bank. Feed is delivered directly into the feeder. Corn is handled only once.

Leslie Hoffman, Story county, Iowa, says, "Much feeding management is eliminated. When I place an order, I just tell the elevator manager the weight of my hogs and recommended protein levels are mixed in. Delivery is usually made the same day."

Convenience is what sells most farmers on the grain bank. "Even the farmer who has his own hammer mill will sometimes use the telephone delivery service," says Ray Fowler, manager of a Greene county, Iowa, feed mill.

This system also allows greater efficiency of operation. Feed

Our grade school children can name the inventor of the cotton gin, which revolutionized that industry years ago or the models of most every tractor made. Yet, how many of us can give the names of the men responsible for the tractor, which has had such terrific impact on farming? In 1901, our first successful gasoline-powered tractor was completed by two young mechanical engineers, Charles Hart and Charles Parr. The first Hart-Parr factory was located in Charles City, Iowa. It still is standing and is now owned by the Oliver Corporation, farm equipment manufacturers.

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must be mixed more or less regularly. But corn can be hauled to the mill at convenient intervals.

"It's a cheap hired man for me," figures Merrill Randau, hog man in Story county, Iowa.

"Home grinding ties up both a tractor and man. I couldn't afford to do my own grinding, especially when field work is pressing."

However there are problems in addition to the higher cost. Here are some drawbacks of the grain bank:

● Feeders should be large enough to accommodate sizeable loads. There will be some extra handling of ground feed otherwise.

● Bulk trucks are heavy. Getting up to the feeder may be difficult in bad weather. Well-drained yards and feedlots are necessary.

● Chances of diseases being brought to the farm are increased.

● You'll need to check feeders regularly and plan feed needs in advance. Profits can nosedive quickly if you're caught with empty feeders.

● Corn you deliver to the grain bank may not be the same corn that goes into your feeders. However, most mills accept only No. 2 corn testing under 14 per cent moisture. So quality of the feed grain will vary little.

A streamlined feeding program pays dividends. The grain bank is one method. Some close figuring will tell if it will pay for you.

"In Perfect Contentment"

A dairyman told me the other day that in early September he was feeding his cows both roughage and grain just about as liberally as he would in the winter months.

We went out to see the cows, and it was true that they were getting practically no feed from the pasture.

A few miles away, on another farm, cows were lying down in the middle of the morning on a pasture of alfalfa and grass and chewing their cuds in perfect contentment. The owner of this herd was giving the cows very little hay and silage.

What made the difference?

The answer given by the owner of the second herd was *commercial fertilizer*. For years he has been fertilizing pastures and meadows very heavily, which he says encourages grass and legumes to grow even when it is dry.

—Hugh Cosline, Editor American Agriculturist

Dairying In The 49th State

In Alaska, they pay $100 a ton for poor hay and sell milk for $11.00 a hundred . . .

Condensed from Western Dairy Journal
L. P. Emmerick

I HAD an opportunity to visit Alaska the week before Congress passed legislation making it the 49th state. My first plane stop was at Juneau, the capital, lush with foliage, almost 24 hours daylight, and with its high cliffs and massive Mendenhall Glaciers.

From Juneau to Fairbanks, which is located more centrally in Alaska, it was necessary to set my watch back two hours, which gives some idea of the size of this new state. Late June in Fairbanks was reminiscent of northern New England in respect to climate, its white birches, elders, poplars and evergreens.

Next stop, back to the coast at Anchorage, the largest and more typically American city of about 50,000. From there it was only about 50 miles to Palmer in the heart of the Matanuska Valley, the most developed agricultural part of Alaska with the best potential, especially for dairying.

In the Juneau area, dairying, in fact any farming, is limited. I visited the three main dairy farms: Frank Maier has mostly Jerseys and some real good ones; Maryland Peterson has a Guernsey herd; and Francis Smith has had Ayrshires but is rapidly changing to Holsteins. All three are raising young Holstein bulls, an indication of the trend.

In all parts of Alaska, roughage was a big problem. At Fairbanks, for example, shipped-in alfalfa hay was costing $100 to $105 per ton. The hay I saw at that price would not be considered good by any good western United States dairyman.

That it is possible to grow all of the needed roughage and even some of the grain is being proven by Don Creamer, Fairbanks, who has perhaps the largest dairy herd in Alaska. With milk at Fairbanks selling at 45c per quart, he should have a profitable enterprise.

The real start of Alaska agriculture dates back to May 1935 when the vanguard of 200 families arrived in Matanuska. They were mostly from Minnesota, Michigan and Wisconsin, as part of a government farm colony created because of widespread

Reprinted by permission from Western Dairy Journal, 4511 Produce Plaza, Los Angeles 58

unemployment in the U. S.

Basically the purposes of these pioneers were to build a home and new life in the wilderness of a new country—to raise crops and families and to give a permanence to a population that had previously followed gold, furs or fish.

This they have accomplished under very trying conditions, and now the Matanuska Valley produces more food than all other parts of Alaska combined. This is not because the climate or soil is better; it is mainly because there is more cleared land created by the 1935 start. There is now about 10,000 acres of cleared land in the valley.

When the colonists first arrived they lived in tents, and drew lots for their 60 acre tracts. Each family had its choice of five basic house plans, and two barn plans. The barns were planned to house a team of horses, a couple of cows, a granary, storage for machinery and hay storage overhead.

The houses and barns on two or three tracts were generally built close together. Each family was furnished a team of horses and a cow, and allowed $200 for furniture.

Clearing land for farming was a big job. Even with heavy government land-clearing equipment, a lot of man-killing work was required. Fifteen acres of land was cleared to begin with on a contract basis of $55 per acre, and another 15 acres two to four years later at $72 per acre. The average cost now of clearing land is about $150 per acre.

Many changes have occurred since those early days. You can still recognize those early built barns, but now many have one-story milking barn attachments to hold 20 to 30 cows. Changes of ownership have occurred and now many of the farms are composed of two, three or more of the original tracts.

The soils of the Matanuska Valley, like most of Alaska, are low in fertility. Heavy applications of manure and fertilizers, especially nitrogen, are necessary to obtain top yields. The top soil, which is generally not very deep, has a fine silt subsoil that even tree roots do not penetrate.

On dairy farms, brome grass is the chief grass seeded, although there are clovers, and the native volunteer grasses give them a hay mixture that seems to be as good and sometimes better for milk production than the imported alfalfa hay.

Farm management practices are being modernized and trench silos for grass silage are becoming more numerous. In properly constructed and handled trench silos, the silage does not freeze as badly as in an upright silo. The rotary chopper is the most

popular piece of machinery I saw and seems to be doing an excellent job for both silage and hay.

Grain growing is increasing in acreage—mostly barley, but some oats. Most dairymen feed a complete balanced grain ration.

In the Matanuska Valley, milk is marketed through Matanuska Valley Farmers Cooperating Assn. The present price to farmers is $11 per cwt. for 4% base milk and $6.50 per cwt. for surplus. The quantity of surplus milk is on the increase.

Milk retails at 40c per quart for fresh milk, and 30c for reconstituted milk. The reconstituted milk is made from shipped-in dry skim milk and a liquid source of fat.

The increased use of reconstituted milk in Anchorage is creating the surplus of fresh milk. The puzzling thing to me was that the farmer-owned co-op dairy is making and selling the reconstituted milk, and so in effect members are creating their own surplus problem.

The Agricultural Experiment Station has been a constant source of improved farming methods for all Alaska, and especially for the Matanuska Valley. Developing barley and brome varieties for Alaskan climatic conditions, and encouraging the use of grass silage are just a few of their accomplishments. The quality of the dairy cattle in Alaska has been greatly improved with the use of artificial insemination from a good group of bulls maintained at the experiment station.

Larger Ewes Produce Larger Lambs, Tests Show

The size of a yearling ewe before first breeding is a good indication of how large her lambs will be, both at birth and weaning time.

Tests at the U. S. Department of Agriculture's Southwestern Range and Sheep Breeding Laboratory at Fort Wingate, New Mexico, showed that heavier ewes—regardless of breed—produce heavier, faster-growing lambs than lightweight ewes.

In the 4-year USDA tests, ewes were grouped by weight. The lightest group averaged 65.4 pounds as yearlings and the heaviest, 92.7 pounds. The heaviest group, with an average weight advantage of 26.3 pounds, produced lambs averaging 1.29 pounds more at birth and 10.5 pounds more at weaning.

USDA scientists say quicker profits from breeding flocks should be possible as a result of this finding because culling can be done before breeding rather than after each ewe has produced a lamb. In addition, the bigger ewes have more skin area for growing wool.

—Texas A&M College

FUN ON THE FARM

A Collection of Jokes and Humorous Farm Stories

Married Life: One undarned thing after another.

★ ★ ★

Two farmers, one from Kansas and the other from Texas, were discussing poor crops, each outdoing the other in his pessimistic statement. Finally the Texan said:

"Well, it's been a mighty poor year with hardly a drop of rain, but still not as bad as the one year I remember. That year, we ate fourteen acres of corn at one sitting."

★ ★ ★

A college student just in agricultural college wrote the following note home:

"Dear Dad: Gue$$ what I need mo$t of all. That'$ right. $end it along. Be$t wihe. Your $on, $tephen."

But dear old dad was not to be outdone. He wrote back:

"Dear Stephen: NOthing ever happens here. We kNOw you like your school. Write us aNOther letter. NOw I have to say goodbye. Your Dad."

★ ★ ★

No wonder a hen gets discouraged. She never finds things where she laid them.

The new doctor was the only one available when Mrs. Smith was taken ill. He went upstairs to the patient's room. In a few minutes he came down to ask, "Have you a cork screw?"

He took the cork screw and ran upstairs again. But several minutes later he was back down a second time. "Got a screwdriver?" he asked. And bounced upstairs again with the screw driver in his hand. Almost immediately he was back down again, to call: "A chisel and hammer, quickly."

The distraught husband could stand it no longer. "For heaven's sake, doc," he begged, "what's the matter with my wife?"

"Don't know yet," the doc replied—"can't get my bag open."

★ ★ ★

When a girl is as pretty as a picture, most fellows like to take a look at the frame.

★ ★ ★

The two most difficult careers are entrusted primarily to amateurs: citizenship and parenthood.

★ ★ ★

A young mother of four small children in Canada received from

friends in the States a gift of a play-pen.

"Thank you so much for the pen," she wrote. "It is wonderful. I sit in it every afternoon and read. The children can't get near me."

★ ★ ★

Sign on a farm:

"Notice to hunters: "Don't shoot anything that isn't moving. It may be my hired man."

★ ★ ★

A mother listening to the evening prayers of her sleeply little daughter was astonished and amused to hear the following:

"Now I lay me down to sleep,
I pray the Lord my soul to keep.
When he hollers let him go,
Eenie, meenie, miny, mo."

★ ★ ★

The high school girl was telling her family about her home economics class: "Do they let you eat what you cook?" asked her mother. "Let us?" the girl answered. "They make us."

★ ★ ★

An elderly farmer and a rather seedy looking city chap sat waiting in silence on a bench in the railroad station. After several minutes had gone by the city fellow turned to the farmer:

"Excuse me, but could you loan me a cigarette paper?"

"Sure," the farmer said and passed one over.

After a few minutes, the city fellow asked for some tobacco which the farmer furnished by handing over his sack of Bull Durham.

Some seconds passed and the city fellow, after returning the sack, asked for a match.

The farmer turned to him and said:

"Friend, you don't have nothing but the habit, do you?"

★ ★ ★

The prosecution had been trying all morning to establish the presence of a chronic old moonshiner at a woodland still. However, the effort seemed hopeless when a raiding revenuer admitted he could not make positive identification because the 'shiner had fled when he was some hundred yards away.

"Well, you'd better get some specs, Sonny Boy," blurted the accused. "I knew you the jiffy you jumped out of them bushes."

Two old coon hunters were swapping stories about their dogs.

"Why," said one of them, "I had a yaller hound once and every time just before I went hunting I'd whittle out a board in the shape of a coon hide stretcher, just to show him the size of the one I wanted, then I'd set it outside where he could see it. Well, sir, one day my wife set the ironin' board outside and that critter ain't come back yet!"

Big Profit On Low-Cost Testing

One-third of the milk cows in the U.S. don't make a profit. You can spot these money-losers by weighing milk only once a month . . .

Condensed from
Massey-Ferguson Farm Profit

IT will take better dairy cows to pay their way in the years ahead. Production costs are sure to be up, especially labor and equipment. And milk prices may average slightly lower.

It means more emphasis must be placed on getting rid of your low producers—the ones that are probably losing money. The only way you can really spot these culprits is with a reliable testing and record-keeping program. And there's now a good one that does the job for as little as 5c a month per cow.

Introduced nationwide about two years ago, the easy weigh-a-day-a-month system has proven itself an effective way to cull the cows that don't meet expenses. About 3700 dairymen with 30,000 cows now boost their profits with this low-cost plan.

Near Rosendale, Wis., Eldor Altmann culled five of his 25 Holsteins with "WADAM" in 1957. This raised his average 1958 production 788 lbs. to nearly 10,000 lbs. per cow. "We had no idea some of those we culled were producing only about 6000 lbs.," reports Altmann.

Reporting feed information too, the Altmanns noted their returns over feed costs jumped from $152 to $160 per cow, even though buying feed had forced feed costs up $11 each.

Dairy experts like J. F. Kendrick, head of USDA's Dairy Herd Improvement Section, emphasize that the best commercial herd test is still the standard DHIA, followed by owner-sampler. You get butterfat tests on each cow as well as milk weights and more help from an experienced supervisor.

But Kendrick recognizes some distinct advantages of WADAM, especially for the man with a small herd. It's easy, and the cost is low: only $1 a month for a 20-cow herd compared with $6 for owner-sampler and $10 for DHIA.

Thirteen Ross County, Ohio,

Reprinted by permission from Massey-Ferguson Farm Profit, 710 N. Plankinton, Milwaukee 3

herd owners have another good reason. "We couldn't keep a good DHIA or owner-sampler tester for a full year," says Marvin Prince of near Frankfort. "Now, with the county agent's cooperation, we can depend on WADAM to spot the boarders and select the cows and heifers to keep."

WADAM has also been a big boost to dairy profits in Illinois, where the basic program started. "Most herd-owners cull 20% to 25% of their cows the first year," says J. G. Cash, Illinois dairy specialist. "Average production often rises 500 lbs. per cow."

In Madison County, Ill., where Assistant Farm Advisor Eugene Aylward supervises 500 cows on test, 59 were culled during the first half of 1958. "I no longer have money-losers in my herd," says Marvin Stille, one of Aylward's 29 cooperators. "But WADAM continues to help me select high producers to keep and breed."

How much milk should a cow give to break even? Most common figure is 250 lbs. of butterfat per year. That's 5000 lbs. of 5% milk, 6250 lbs. of 4% milk and 7145 lbs. of the 3.5% milk that most cows produce.

"But that only meets costs," says Jim Crowley, Wisconsin dairy specialist. "For a reasonable profit, your cows should give no less than 350 lbs. of butterfat a year."

Fertilizer Boosts Orchardgrass Yields

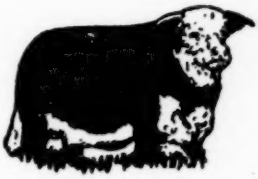
"Fertilization, as indicated by soil tests, is necessary to maintain productive stands of orchardgrass," contends Leslie Hileman, assistant agronomist with the University of Arkansas' Agricultural Experiment Station. Orchardgrass is one of the major permanent winter grasses on many Arkansas farms.

Reporting two years' results of orchardgrass fertilization tests, Hileman said greatest yield increases were obtained from nitrogen applied in the spring. Highest hay yields were obtained when 80 pounds per acre of nitrogen were applied as one treatment in either February or April after 50 pounds of phosphate per acre had been applied the previous fall.

Splitting the nitrogen application may be beneficial where orchardgrass is to be pastured. If orchardgrass is grazed in the fall and early spring a farmer may get more grazing potential by applying 40 pounds of nitrogen in the fall and another 40 in early spring. At any rate, a farmer would need to gear his nitrogen fertilization program to the grazing period.

—Arkansas Agricultural Experiment Station

Scales Supplement Breeder's Eye



Performance testing in Ontario shows advantages which accrue to the beef producer using this modern tool . . .

Condensed from
The American Hereford Journal

W. P. Watson, Live Stock Commissioner,
Ontario Dept. of Agriculture

IT has been stated that the primary function of beef cattle is to convert feeds, particularly roughage for which there is no ready market, into meat, a product which is both nutritious and appetizing, hence in keen demand.

If that theory is correct then it is logical to assume that the most efficient converters provide the greatest net returns. However, that is a dangerous conclusion because it is based on the assumption that all cattle, regardless of their quality, sell at the same price. As everyone knows, such is not the case; from time immemorial quality has been recognized in the form of higher returns. So ability to convert feed into meat must never become the sole consideration of beef producers; they must strive to produce a high quality product as well.

Shows to Continue to Be Important

In the past most beef cattle improvement programs have been designed to focus attention on type and quality. Standards were, and still are, established in showrings where the top prize-winners conform to a type deemed to be most acceptable to all concerned. For the most part the recipients of blue and red ribbons are thick, blocky and low-set cattle, carrying a wealth of deep, smooth fleshing. Attention is paid to the breed character displayed in the head, the strength of the legs and the manner in which they are set under the body. There is no denying that friendly competition generated by this system has contributed to an improvement in the type and quality of beef cattle and that the showring will continue to play an important role in the foreseeable future.

Unfortunately, this method of appraisal does not give due consideration to factors which have a significant bearing on the economy of beef production. For years, breeders were led to believe that animals with above-

Reprinted by permission from The American Hereford Journal, 500 Graphic Arts Bldg., Kansas City 5, Missouri

average width between the eyes, prominent nostrils and a large heart girth were good doers. However, research workers have discovered that although this is frequently the case it is not necessarily true in all cases.

These research workers have also discovered that the characteristic, rate of gain, is highly heritable and that there is a positive correlation between rate and economy of gain. This revelation has provided the basis for performance programs which are now being conducted in most of the leading beef states and in several provinces of Canada. The method of operation may vary from one jurisdiction to another, but the objective is the same in each case; it is to obtain basic information about beef cattle from the standpoint of their ability to perform their function of converting feed into meat.

Beef Herds Are Relatively Small

If the method of procedure in Ontario differs from that employed elsewhere, there is a very sound and logical reason. To appreciate that reason it should be pointed out that only 30 per cent of Ontario's cattle are of beef breeding. Commercial beef herds are relatively small, ranging in size from 15 to 25 cows. In many instances the cows are milked, with the milk being separated, the cream sold and the skim milk retained for use in feeding calves, pigs and poultry. As a general rule, about one-half of the cows in these herds calve in the spring, the other half in the fall.

The purebred herds are small, too. Most breeders count on the sale of bulls for the major portion of their revenue. Consequently, if prospects for sales appear to be reasonably bright the majority of male calves are kept entire. Because the demand for bulls is divided about equally between spring and fall, calving is spread over the year. Even so, January and September are the highest months from the standpoint of numbers of calves born. Under the circumstances, any policy which would require all

Half of the people of the world's population still earn less than $100 per year.

calves born during the year to start on test at the same time is quite impractical.

This and many other situations, peculiar to the beef industry of Ontario, had to be recognized by the Board which was charged with the responsibility for evolving and administering a program of performance testing. This Board, appointed by the Minister of Agriculture, is comprised of the head of the Animal Husbandry Department at the Ontario Agricultural College, who serves as chairman; a representative of

each of the three beef breed associations, a commercial producer, an official of the Canada Department of Agriculture, and the Live Stock Commissioner, who acts as secretary. When this Board assumed office in 1950 most performance-testing activities throughout Canada and U. S. were confined to experimental stations and to a few private breeders who were interested in obtaining weights on their cattle at different stages of development.

Reason for Lack of Early Support

From the outset the Board favored a plan whereby all tests would be conducted at a station. Accordingly one of the barns on college property was equipped with individual pens and set aside for testing purposes. Breeders were invited to participate in a progeny-testing program designed to provide information about the breeding ability of their herd sires. Originally the results were based on the performance of four steer calves, by the sire nominated for test. Records on rate of gain and feed consumption were maintained. At the end of a 196-day test period each steer was slaughtered and the carcass scored. Breeders did not support the program, presumably because it obligated them to castrate potentially good bulls. While carcass studies provided a great deal of useful information, the benefits derived therefrom did not compensate for the general lack of breeder interest in the program.

Assuredly, something had to be done, and the obvious approach was to test young bulls before they got into the possession of the commercial producers who were destined to use them. Hence, in 1956, the policy was revamped. Breeders were afforded the opportunity of testing their young bulls. Inasmuch as bulls are born during all months of the year, an age rather than a particular time of the year was selected for starting the test. Since most beef cows will nurse their

The increase in size of families has been greater among non-farm families than it has among farm families in recent years.

calves for at least seven months, the policy calls for bulls to be delivered to the station at 7½ months. This provides for a two-week adjusting period before they go on test at eight months. The test period has been reduced to 168 days. Weights are taken on two successive days at the beginning and at the end of the test and, in each case, the average is considered to be the official weight. In addition, weights are taken at 28-day intervals. At the conclusion of a test each bull is

returned to the breeder. Incidentally, he is required to pay 75 per cent of the feed costs, the balance being absorbed by the Board.

At the station bulls are dry fed, their ration consisting of good quality hay and a coarsely ground meal mixture containing a variety of grains and enough protein supplement to bring the protein content up to 13 per cent. Hay is available in racks at all times while the grain mixture is fed twice daily according to appetite. Naturally, bulls' appetites vary, but generally speaking they will eat at the rate of two pounds of feed for every 100 pounds of body weight. Thus, an 800-pound bull will consume about 16 pounds of feed daily. Although the bulls are housed and fed in individual pens, they are turned into yards daily for exercising.

Becoming wiser today isn't an unmixed blessing. It causes a person to realize what a fool he was yesterday.

Provision for Home Testing

This program had not been in effect very long before the number of applications for test exceeded the accommodations at the station. Consequently, the Board was obliged to make provision for home testing. Accordingly, this practice is now permitted when pen space at the station is not available. Since this change was made testing has stepped up to the point where approximately 10 bulls are tested at home for every one at the station. Even so, an attempt is made to have every participant test some bulls at the station.

At the end of the test, bulls are classified into one of the following grades: Breeder, Commercial, or Plain. These terms were chosen because they appeared to be self explanatory. Hence a "breeder" bull is one that is considered good enough to be used in a purebred herd. A "Commercial" bull may be lacking in breed character or have some other minor defect which reduces his appeal to a breeder of purebred cattle, but which does not impair his usefulness in a grade herd. A "Plain" bull is just what the term implies—namely, the kind of purebred that should not be allowed to propagate the species. In the interests of maintaining uniformity all classifying is done by one man. For the present this service is being performed by a member of the provincial livestock extension service.

Today the majority of breeders who depend on the sale of bulls for the major portion of their income are participating in the program. A few are not testing all their bulls, the exceptions being bulls that are selected for showing at the major fairs. Such

bulls are raised on nurse cows, and since the use of nurse cows is not permitted under the policy breeders refrain from testing those that are raised in this manner.

Stimulant in Premium Policy

Undoubtedly, Ontario's bull premium policy has been a factor in stimulating interest in performance testing. Several years ago the provincial Department of Agriculture adopted a policy of paying premiums to farmers who bought bulls, approved from the standpoint of type and conformation, at sales sponsored by Breeders' Clubs. In 1957, the policy was changed to provide for the payment of a higher premium to purchasers of performance-tested bulls. To be eligible for this designation a bull had to be classified Breeder or Commercial and make at least 2.30 pounds per day during the test period.

A recent survey showed that a high percentage of the bulls were meeting these requirements, including some that finished at weights ranging from 870 to 950 pounds. Although these latter bulls made very satisfactory gains on test, the majority could best be described as "pony type" bulls. Recently the Board decided that these bulls were not worthy of special recognition so added the proviso that bulls must have a lifetime gain of at least 2.15 pounds per day. In this particular instance, lifetime refers to the period of time between birth and the end of the test; that is, approximately 408 days. Thus, in order to qualify, a bull must weigh at least 950 pounds, a figure which is still below the average of all bulls tested.

A few observations gleaned from this program are worthy of mention. First, the results show that there is a positive correlation between rate and economy of gain. Invariably the fastest-gaining bulls require the lowest amounts of feed per pound of gain. Breeders like to test some bulls at the station because it gives them an opportunity of checking on feed consumption. Although they do not get this information on home tests, they have the satisfaction of knowing that a fast-growing bull is an efficient converter of feed.

George Washington experimented with alfalfa at Mt. Vernon, in 1760.

There does not appear to be any significant correlation between type and performance. Nevertheless these two characteristics are not incompatible. A great many bulls of good type have demonstrated their ability to gain at a rapid rate and vice versa. Furthermore, it is not necessary to produce big, rough

bulls in order to get good-gaining bulls.

Home Tests a Reliable Indicator

During the period when all tests were conducted at the Station some breeders were inclined to the belief that better gains could have been made if the bulls had been tested at home. However, this contention has not been borne out by the results. On the average, gains have been slightly higher at the station than at home. Experience points to the conclusion that home tests, when properly supervised, provide a very reliable indicator of a bull's ability to gain.

Today farmers are conscious of the trend towards higher costs. Unfortunately, the prices of many agricultural products have not increased in the amounts necessary to compensate for these rising costs. Consequently, if farmers are to remain solvent they must strive by every means possible to cut their costs. Performance testing provides information, which, if used wisely, can give a valuable assist to the commercial beef producer.

In so far as the purebred breeder is concerned, the information should not be used as a gimmick to sell bulls; instead it should furnish the basis upon which a sound program of selection can be built. Performance testing is not the only tool that should be used in the program; rather it is an additional one. A set of scales is not an adequate substitute for the eye of the breeder, but they can be used effectively to supplement the knowledge gained from experience.

New Swine Vaccine

A new vaccine that gives longer and stronger protection against erysipelas and erysipelas arthritis has been produced by a group of American scientists. It gives complete immunity for four months and excellent protection for six to nine months.

The vaccine is a modified live culture of *erysipelas rhusiopathiae*, the bacterial organism that causes erysipelas. Though it contains live erysipelas bacteria, the organisms are avirulent, or not capable of carrying the disease. Their being alive, however, allows the vaccinated pig to build up a better defense against the disease than is possible with killed bacteria.

In tests to date, it has reduced arthritis by about 80 per cent.

For continuous protection against erysipelas, vaccination of breeding stock and their young eight weeks after farrowing is recommended. Suckling pigs temporarily carry some of the sow's antibodies against erysipelas. —*National Hog Farmer*

New from Britain: Manure by "Irrigation"

A new system mixes and chops manure at the barn, pumps it up to a mile, and spreads it on your fields . . .

Condensed from Implement & Tractor

Tom Gilling

NOW in production in Britain, and to be available in North America soon, is a mechanical "irrigation" system by which manure can be pumped anywhere from a central farmstead.

The standard plant, driven from a farm tractor, can deliver the liquified manure to fields up to a mile distant, say the makers, Wright Rain Ltd., Ringwood, Hampshire, England.

Secret of the success of the operation is a type of piston pump and a combination mixer-cutter through which all types of straw, manure and liquid can pass and be delivered at high pressure. These two pieces of equipment are located where required alongside a farm collection tank to pump liquid, straw, and urine through irrigation pipelines.

Wright Rain Ltd. has achieved singular success by coupling the piston pump (developed from original German design) to its own irrigation system, and the coupling is already fitting up many English farms with this method for handling manure in liquid form.

At a recent demonstration on Wright farms, a Fordson Major tractor provided power for the complete outfit, but where electricity is available, separate motors for individual pieces of equipment can be used.

Over 20,000 installations of similar type are in use in Europe —mostly in Germany, where the method originated — but manufacture of this latest and most improved type of equipment is now being carried out in Britain.

The collection tank or sump for the material is usually made of concrete, and can be built with farm labor. Normally, such a tank is fitted with an agitator paddle which revolves at about 15 rpm.

To start operations, water is run into the tank to a depth of

Reprinted by permission from Implement & Tractor, 1014 Wyandotte, Kansas City 5, Missouri

about two feet, and, unless manure is in a loose state, contents are stirred for 10 minutes twice a day.

Tank size depends on the waiting period desired between pumpings to fields, but ordinarily capacity should allow for one cubic yard of cowshed manure and straw per head for every three weeks. Allowance should be made for normal yard drainage.

If long straw is used for livestock litter or bedding, the mixer-cutter is essential; about 5 hp drives it.

Above the tank is a hopper into which straw litter is fed. This can be done by hand—a rather slow job—but quick automatic feed-in is being planned. The straw is drawn into the mixing chamber by the flow of liquid and sucked into a central outlet pipe. As it is sucked in, a four-bladed cutter driven at about 1,000 rpm chops it into short lengths as it passes into the liquid.

The Measure of A Man
Give some guys an inch and they think they're a ruler.

Delivery is then normally to fields, but the system can be worked so as to recirculate back into the storage tank for later use, if needed.

The "heart" of the system is a novel type of piston pump through which can pass the solids and straw and even small type stones likely to be encountered in farmstead muck.

Size of pump can vary (a three piston type is used in most British installations, and this is well within the pto power of a medium farm tractor). A big size needing up to 50 hp to drive can be used where distances for delivery are exceptionally long.

As demonstrated in England, however, mixer-cutter, and pump —can be well dealt with by a Fordson Major or similar-powered tractor at far less than maximum throttle.

At the field delivery end a thrower or "gun" takes care of muck liquid distribution. This "gun" is mounted on a field carriage which an operator can wheel where wanted. Delivery to the "gun" is through the ordinary Wright alloy four-inch irrigation mains, which can be laid in any direction required.

The "gun" sends the muck-liquid-straw showering over roughly an acre of ground at a time before needing to be shifted to a new position.

Price of the outfit described is well under the equivalent of $2,500 in Britain and it is estimated that such a farm installation here, complete with concrete storage tank could be considered in the neighborhood of $3,000.

Don't Overlook Liability Insurance

You are responsible for the safety of visitors or employees. If negligence is proven, they can collect from you. The results may be disastrous.

Condensed from Hoard's Dairyman
Robert S. Smith, Cornell University

FARMER'S comprehensive personal liability or public liability, as it also is known, protects the farmer against injuries to members of the general public. Employer's liability and workmen's compensation give protection against injuries to employees.

Both types of liability insurance deserve careful consideration.

Public Liability Insurance . . .

Public or general liability insurance is used to cover liability resulting from injuries to, or death of, members of the general public, or from damage to their property that arises out of the activities of the farmer. Any property owner is responsible for the safety of those on his property. On farms, the presence of livestock, power machinery, and farm ponds adds to the dangers involved and the need for insurance of this type.

Policies may be "general" in that they cover the family of the insured on the home farm only, or "comprehensive" in that they cover the family of the insured anywhere. Basic coverage provides for a maximum of liability coverage, usually $10,000, and a maximum of coverage for medical treatment that might be needed, usually $250. The comprehensive policy also has a $1,000 property damage feature.

Additional coverage may be obtained by increasing the amount of basic coverage, or by adding endorsements to the original policy to cover such things as loss of livestock in highway accidents, liability due to accidents occurring while the farmer is engaged in custom farming, coverage for liability that might arise from the sale of farm products, and the like.

Some examples of risks covered by public liability are:

1. A salesman falls on an icy step and breaks a leg.
2. A neighbor's child is bitten by the farmer's dog.
3. A hunter is injured while on the farm and claims negligence on the part of the farmer.
4. A visitor to the farm falls

Reprinted by permission from Hoard's Dairyman, Fort Atkinson, Wisconsin

from a wagon and is injured.

Public liability offers the farmer no protection against claims brought by his regular employees for injuries, accidents, or the like.

Experience has shown that the courts may hold the farm owner responsible for the safety of members of the public who have access to the farm. Experience has also shown that if negligence is proven, awards can be large and their effect disastrous to the farmer.

Public liability offers protection to the farmer against a wide variety of risks which can result in severe losses. The cost is relatively low. For these reasons, it is recommended that all farm owners carry this type of insurance.

Workmen's Compensation . . .

Farmers in most states are not required to carry either workmen's compensation or employer's liability insurance regardless of the size of business or number of hired men. However, farm operators who are also engaged in other business activities may be required to carry workmen's compensation because of these activities.

In spite of the fact that insurance of this kind is voluntary, many farmers feel they must carry it. Workmen's compensation and employer's liability are both designated to protect farmers against claims that arise from injuries suffered by employees while engaged in farm work.

Workmen's compensation gives broader protection to both the farmer and the hired man than does farm employer's liability. Workmen's compensation pays all hospital bills, compensation to replace part of lost salary or wages, payments for loss of parts of the body, and benefits in case of death. The payments are made regardless of negligence on the part of the farmer, and there is no top limit to the total amount which may be paid under the provisions of this policy.

Dairy scientists say it is profitable to feed molasses to dairy cattle when the price of 6½ gallons is less than the price of one bushel of corn. One or two gallons may be poured over the hay daily to add palatability to the ration.

Farm employer's liability insurance usually is written as an endorsement to a public liability policy. Theoretically, no payments are made except when the farmer is proved negligent and then payments are limited to the value of the policy.

In practice, the insuring company frequently will make a settlement without proof of negligence, especially if the amount involved is small. Basic limits are

usually $5,000 for one person and $10,000 for two or more, depending on which type of public liability policy is carried. Additional coverage may be purchased.

This type of insurance provides somewhat less protection for the farmer and considerably less for the hired man than does workmen's compensation.

Rates for workmen's compensation insurance vary widely from state to state and also may vary with the type of farming. Premiums are calculated on the basis of the farm payroll. It is the intent of the regulation that non-cash privileges, such as house rent received by hired men, shall be included in the payroll calculation.

In some states, the rate per $100 of payroll has recently been as low as $1; in others it has been as high as $6. There is usually a minimum charge, regardless of size of payroll. Farm employer's liability rates range from 50 per cent to 100 per cent of workmen's compensation rates.

The costs of workmen's compensation or employer's liability insurance are of major importance. Those farmers with no employees need none of this type of coverage, but those with large numbers of employees, especially transients, do need coverage. Most farmers fall between these extremes, however, and the decision is difficult.

As with most types of insurance, there is no definite rule to follow. The farmer must decide whether he is able and willing to pay the high price to reduce this liability risk.

Health and Accident Insurance . .

Every farmer expects some expense from illnesses and accidents among members of his family. Sickness or accidents also can disable a farmer and cause lost earnings.

It's very important to consider health and accident insurance as a partial offset to these risks.

Health and accident insurance is available in many different forms. Most of these are intend-

Iowa and Illinois produce 1/3 of the pigs grown in U. S.

ed to cover the "first" costs rather than the large maximum costs. Types of coverage include:

Hospitalization insurance pays for all or part of expenses of hospital care. Policies may provide coverage against such expenses as board and room, medication, anesthesia, and surgeons' fees. The broader type policies are often referred to as hospital, medical, and surgical insurance.

Sickness insurance pays an indemnity to partially compensate for loss of earning due to prolonged illness.

Accident coverage usually is written to provide for payments

in case of accidents resulting in death or in loss of limbs, eyesight, or other impairment of the body. Payments may also be received to partially cover the loss of earnings that result from accidents. Coverage usually is in stated amounts for a given situation.

Policies may be obtained which will provide for any of the above coverages or all of them. Cost of the policy will depend on the amount of coverage desired. If all expenses are to be paid by the company, this type of insurance is quite expensive.

Major medical insurance is a relatively recent development in the health and accident insurance field. It is a deductible plan to guard against "catastrophes" and is sold primarily by life insurance companies.

Health and accident insurance can protect a farm family against sizable outlays in cash that may result from sickness or accidents to members of the family. All families experience some medical expense. Very large expenses are possible, but unlikely.

The common health and accident policies are limited in scope. That is, they offer protection against the relatively small expenses that are likely to occur, but not against the very large expenses which could be disastrous to the family finances. Major medical insurance does offer protection against these large expenses, but not against small ones.

A farmer must deside whether he wants protection against the small, regular medical expenses, or against the large, unlikely expenses, or both. He can carry the common hospitalization insurance for protection against regular expenses, or major medical insurance against high and uncommon expenses.

It seems more important for the farmer to try to obtain protection from the large expenses that may occur, and to accept the more usual small expenses on his own. A "deductible" type of insurance called "major medical" or "catastrophe" insurance is designed specifically for this type of protection. This gives him insurance against the expenses he cannot afford to handle but does not put him in a position of paying premiums for protection he can do without. This type of insurance is well suited for the man who can handle normal small expenses, but desires partial protection from large sums.

For best results, lime should be applied several months before a crop is to be planted.

At present, several major life insurance companies are offering a major medical plan which cov-

ers the insured and all members of his family. One such plan specifies that the insured must pay the first $500 of expense resulting from each illness or accident to a member of the family. The company will pay three-fourths of the expenses in excess of $500 up to a maximum of $7,500 expense to the company for each accident or illness. The cost varies with the age of the insured, but not with the size of the family. Present rates are:

Age of Insured	Annual Premium
30	$ 79.90
40	95.25
50	114.93
60	149.48

The experience with this insurance is limited, and rates, therefore, may change substantially from year to year.

Major Considerations . . .

Studies of the insurance carried by farmers have shown that a great many farmers carry some kind of protection against accidents or illness or both. All too frequently farmers buy policies and fail to understand the limits of the protection until an illness or accident occurs.

Many limited accident policies are sold which appear to be a bargain because of the low premiums. Very low premiums mean limited protection, since you can't get something for nothing in insurance.

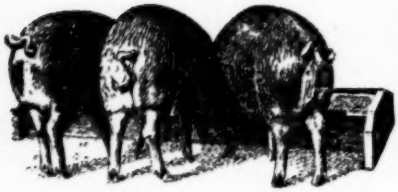
In buying insurance, insure first against the things that would be a financial catastrophe if they occurred without insurance. A major accident or illness would be a financial catastrophe for many farm families.

New Book of Plans Available — Fifty-nine beef and dairy equipment plans have been collected in a new book available from Purdue University. They include silage carts, feed bunks, mechanical bunks, milking plant feeding, calf pen equipment, sun shades, head gates, calf creeps, cattle feeding shelters and working corrals.

Published by the Midwest Plan Service, "Beef and Dairy Equipment Plans" is a 56-page, 8½ x 11 inch book. In addition to complete working drawings, it includes 10 pages of construction details. There are also five pages of design, layout and equipment selection data. Feeding and handling systems are shown in 23 sample layouts. Cutting lists are given for most of the plans.

Plans were designed and developed by livestock and agricultural engineering specialists from the 13 cooperating midwest states. Persons interested in getting copies should write to John Foley at the Agricultural Engineering Department, Purdue, West Lafayette, Indiana, enclosing $1.00 for each copy. —*Indiana Extension*

What Live-Probing Shows



Scottish researchers test the accuracy of the lean meter live pig probe . . .

Condensed from Pig Farming
J. Walker-Love, J. D. Cormack, and R. Laird, Jr.

WHAT help can be expected from the lean-meter in selecting gilts for breeding? How accurate is the live-pig probe in assessing the carcass backfat measurement? Questions such as these are now being answered by investigational work conducted by the West of Scotland Agricultural College.

The results quoted below were taken from 60 Large White pigs which were all probed three days before dispatch to the bacon factory. Each pig was probed at two points, loin and shoulder, at a distance of 1 inch from the midline so as to avoid possible damage to the spinal column. So that these points could be located on the carcass a standard length of string was used, the end being held at the base of the tail, and knots at 16½ and 33 inches identified the points to be probed.

By using the same length of string and base point when working on the carcass the same immediate probe areas were located and, after a little practice, the same probe points could be spotted as blood spots and pock marks on the carcass. Thus it was possible to probe the same spot before and after slaughter. The 16½-inch standard was suitable for most pigs but for the very short pig this standard had to be reduced by 1½ inches.

When taking the reading on the live pig, experience showed that the best method of insertion was a sharp jab to get through the skin as this is the only point at which the animal shows a slight sensitivity. With the left hand on the base plate the probe is gradually pushed into the fat until a definite swing of the dial pointer to the right is observed. This registers the contact of the probe with the lean, and the probe is then withdrawn or inserted a little until it just comes into contact with the lean.

It has been observed, more so with the live pig than the carcass, that momentarily the point-

Reprinted by permission from Pig Farming Ltd., Lloyd's Chambers, Ipswich, Suffolk, England

er may register lean falsely. This occurs when passing through the skin and occasionally when descending through the fat layers. Such movements are a little disconcerting to the novice, but it becomes easier with practice to recognize the true reading, which is definite and lasting. These flickers of the pointer are probably caused by small layers of muscle interspersed in the fat, and they are very much more in evidence at the shoulder than at the loin.

In the interests of accuracy it has been found necessary not to press the base plate of the instrument on the back, but merely to have it in contact. Otherwise the fat, having a degree of mobility, tends to be squeezed out and away from the needle, with the result that a thinner fat is recorded than actually exists.

Generally, snakes with round eye pupils travel during daytime, and those with vertical pupils, at night.

From experience, two further precautions must be taken. A disinfectant, no matter how desirable it may seem, must not be used and the probe must be thoroughly cleaned should a blood vessel be struck. Both deflect the dial readings and cause further variation.

As previous work showed that the lean-meter probe readings were fairly consistent with actual caliper measurements, a comparison was made only between the lean-meter reading before and after slaughter, using the same spot. Repeat readings indicated that the shoulder probe was very much more variable than that of the loin. When the live and carcass readings were compared, the carcass readings averaged 6 mm higher than those on the live pig in the case of loin measurement and 8 mm higher in the case of the shoulder measurement. These differences seem to result from changes in the fat firmness before and after slaughter, despite all precautions to avoid squeezing out the fat when taking readings on the live pig.

After applying the correction of 6 mm it was found that the lean-meter reading on the loin of the live pig was within 2 mm of the true reading (on carcass) in four out of ten cases, within 4 mm in seven out of 10 cases, and within 5 mm in eight out of ten cases. Rarely did the lean-meter give a reading 8 mm or more in error. Contrasting with these results, the accuracy of the live pig probes on the shoulder was very much less; only two out of ten came within 2 mm of the true reading after making the correction of 8 mm, five out of ten within 5 mm, and two out of every 10 mm or more in error.

To bring these figures into perspective, it should be remembered that the differential between an A and B carcass backfat is 5 mm. Obviously, it is almost twice as difficult to predict accurately the shoulder backfat as the loin. Of course, one must relate these readings taken 1 inch from the midline to the official grading, but it was found that they were similar in magnitude to the loin and shoulder fat thicknesses taken at the official grading points.

The lean-meter is not a precision instrument, as the above results demonstrate, but it has a place in the pig industry as an aid in selecting gilts for breeding. Anyone who has tried to judge a live-carcass competition, be he judge or spectator, knows just how difficult it is to pick out the top pig on the hoof. If the lean-meter helps, even in a small way, to make this a possibility then its use is justified.

For use on the commercial farm, where several gilts at bacon weight (200 lb. and over) might be selected for breeding, the lean-meter could be preset, say at ¾ in. (19 mm), limiting the probe to this depth at the loin. If on probing, the pointer does not swing over, then the gilt can be judged in a less favorable light than the gilt in which the pointer swings over. The same method might also be adopted for the shoulder, because of the poorer accuracy of the shoulder probe, more emphasis should be placed on the loin probe when comparing gilts and, in fact, little advantage might be lost by ignoring the shoulder altogether.

It should be stressed that the lean-meter does not give exact readings on the live pig but it is of value in comparing one animal with another.

New British "Cuber" Pelletizes Feed

Because of the great interest in pelletizing forage crops for livestock feeding, the announcement of a farm cuber designed at Britain's National Institute of Agricultural Engineering is of special interest in the U.S.A. The cuber, driven by electric motor, is designed for use with a continuous, automatic hammer mill. The feed mixture from the hammer mill is forced through "cubing" pipes by a hydraulic ram, at a capacity of over 224 pounds an hour. Heat for binding the compressed feed is produced by the pressure created as the ground materials are forced through the pipes. In the NIAE tests, mixtures with about 18 per cent moisture and 4 per cent molasses were used. —*Agricultural Engineering*

ANAPLASMOSIS

Spread by insects or non-sterile instruments, this range disease is one of the west's most difficult animal health problems. Here a prominent researcher discusses what science has learned about it . . .

Condensed from Western Livestock Journal

Kenneth L. Kuttler, DVM

ANAPLASMOSIS is a disease which many cattlemen have come to fear during the past 10 to 15 years. It is not spread through contact as most communicable diseases of livestock are but by insects which carry the disease from one animal to another. Another means of spreading the disease is by the the rancher himself as he vaccinates or dehorns his cattle with instruments which are not thoroughly cleaned between operations.

One of the main symptoms noticed by the rancher is anemia, which is caused by destruction of the red blood cells. The massive destruction of red blood cells produces a pigment which escapes into the tissues and causes icterus, or yellow belly, as it is often called. The exact nature of the causative organism is not completely understood. Some think the anaplasma bodies found in the red blood cells during an attack of the disease are blood protozoan parasites; others maintain that these bodies are lesions resulting from a virus infection.

Losses

Anaplasmosis may, under certain circumstances, produce heavy losses in adult cattle which come in contact for the first time with the infectious agent. Death losses may be as high as 50 to 60% of untreated animals. The cattle become depressed, go off feed and lose weight when they are affected. They are characterized by a yellow or icteric appearance on the lighter portions of the body and on the exposed mucous membranes. The yellow color is the result of excessive destruction of red blood cells, which in turn produces an extreme anemia. The number of red blood cells as measured by packed red cell

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volume may decrease as much as 75% in a matter of a few days.

Treatment of such animals is often difficult, requiring blood transfusions along with the injection of broad spectrum antibiotics. The intravenous or intramuscular injection of Terramycin at the rate of 3 mg. per lb. of body weight has been reported to be effective in treating animals. Early diagnosis and prompt treatment by a veterinarian are frequently the most important factors in preventing high death losses in the face of an acute anaplasmosis outbreak.

Symptoms

Another characteristic feature of anaplasmosis is that the disease produces severe clinical symptoms only in adult animals. Calves and young animals may develop the disease, undergo a subclinical attack and recover without apparent illness. These animals then develop a type of immunity known as premunition, in which they are generally immune from future acute infections but remain carriers of that infection.

These carrier animals are capable of transmitting infection to clean animals. There is at present no practical way of entirely removing the infection from a carrier animal, although elimination of infection may be possible under exceptional cases by massive dosage with certain antibiotics.

At least 18 species of ticks, nine species of horse flies, one species of stable fly and three species of mosquitoes have been shown to be capable of experimental transmission. Most blood sucking insects will probably, under certain circumstances, transmit the disease. Many minor surgical procedures such as dehorning, castration, vaccination and even blood sampling may present a source of infection. The infectious agent of anaplasmosis will remain viable for only short periods of time outside of its natural host. Commonly taught principles of sanitation and cleanliness using disinfectants on instruments between animals will prevent this type of transmission.

Research

During the last few years the amount of research being done on this condition by federal and state agencies has greatly increased. A few years ago, USDA veterinarians in cooperation with others developed a blood test which has made it possible to detect animals having anaplasmosis infections. By using this test, anaplasmosis has been virtually eradicated from the Hawaiian Islands.

One of the principal aims of veterinary science is the elimination or eradication of animal disease. Economists generally point out the long term advantages of this approach. Most live-

stock producers recognize the benefits they have enjoyed in the past by being free of many of the major cattle plagues which affect livestock in other parts of the world. The eradication of anaplasmosis in one geographical location naturally gives hope that some day this disease problem will be eliminated in other areas. The situation in Hawaii, however, is quite different from the western range states. Many of the vectors responsible for the spread of anaplasmosis are not present in the Hawaiian Islands, and the incidence was low at the onset of the eradication program.

Incidence

The incidence of anaplasmosis in the range states varies from one locality to another. Some areas have shown an infection incidence of as high as 70 to 80% and others as low as 1 to 2%. A survey being conducted by the Department of Veterinary Science at the University of Nevada has shown an average incidence of almost 32% infection. To date tests have been conducted on over 1,300 head of cattle.

Experiments conducted at the University of Nevada have shown the rapid spread of infection in clean animals placed on open range in areas where the infection is prevalent. In December 1957, 18 anaplasmosis negative calves were placed on a ranch where anaplasmosis was known to occur. These animals were blood tested periodically for evidence of infection. The following April, four months later, one animal had developed anaplasmosis. In May all animals were turned out and kept under range conditions. During the next four months, 14 additional animals became infected, with a final incidence of 82% anaplasmosis infection.

Significance

None of these 18 animals developed symptoms of acute anaplasmosis. Blood examination revealed an anemia from which the infected animals have never completely recovered. The significance of this finding is not as yet obvious but may produce certain economic implications.

The high incidence and rapid spread of anaplasmosis make eradication based on blood testing almost impossible in the western range states. At least three western experiment stations, including Nevada, are conducting research on this problem in addition to a large scale program being conducted by the Agricultural Research Service of USDA. We must depend upon additional research into this costly and dangerous disease to uncover more of the basic facts and to develop additional programs for the eventual control and eradication of anaplasmosis.

10 Points for Careful Buying

Check these 10 points before making your next, big farm purchase . . .

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HAVE you ever wished you had been a bit more careful in dealing with strange salesmen? Here is a review of buying cautions from the Attorney General of the State of New York which are good for all of us:

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3. *Never* give up household appliances or other items for repairs without first getting in writing an estimate of probable repair cost. Get written assurance no additional charge will be made without your consent, that if you do not want "extra" repairs article will be returned immediately.

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Scientists Visualize Nuclear Reactor to Destroy Crop Pests

Two UCLA nuclear scientists report basic plans for a mobile nuclear reactor specially designed for destroying various crop pests, including parasites, insects and weeds. The main use for such a reactor would be the application of gamma rays and neutrons for sterilizing the soil and ridding it of the several billions of nematodes per acre that infest it. Admittedly research, design and development of a portable reactor would be exceedingly expensive, but by amortizing the cost over a period of a few years, the researchers say it could be greatly scaled down. They believe that use of the portable reactor might even make crop rotation an obsolete practice and point to the fact that there is abundant evidence that sterilized soil produces healthier plants, which in turn produce larger yields than plants in soils that have been merely fertilized. As to possible dangerous effects of radiation on the crops and on the humans and animals that consume them, the sterilizing of the soil would be done before planting and would only be residual and negligible in strength by seeding time. The crops would therefore have little if any radiation carry-over. —*Agricultural Engineering*

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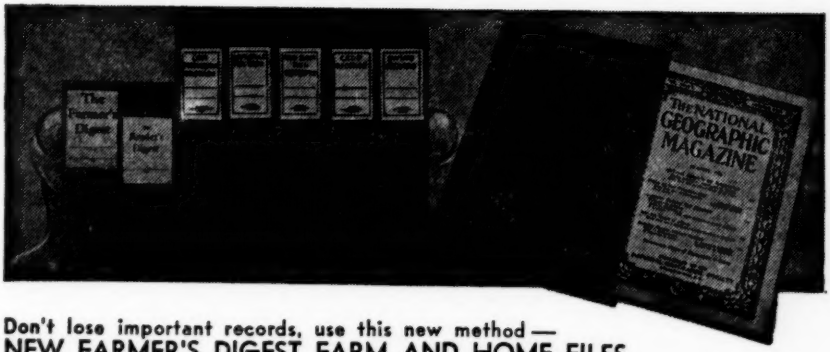

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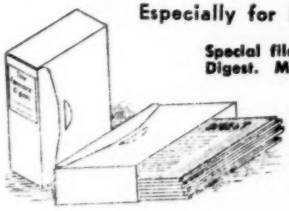

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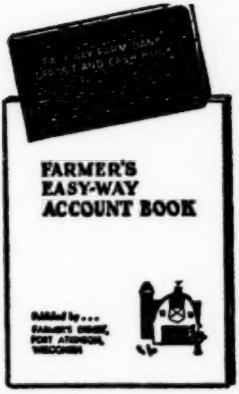

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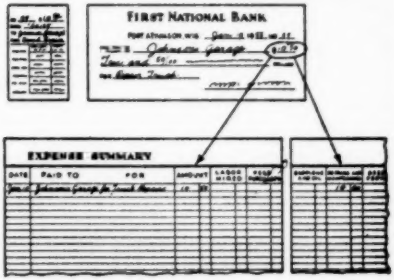

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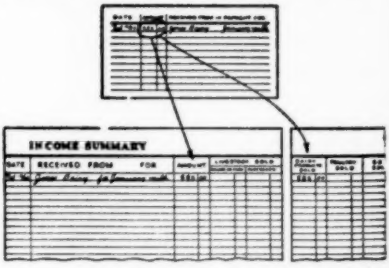

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